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FACTS BOOK

HIV/AIDS

American Red Cross

HIV/AIDS
EDUCATION

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American Red Cross HIV/AIDS Facts Book

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MISSION OF THE AMERICAN RED CROSS

The American Red Cross, a humanitarian organization led by volunteers and guided by its Congressional Charter and the Fundamental Principles of the International Red Cross Movement, will provide relief to victims of disasters and help people prevent, prepare for, and respond to emergencies.

ABOUT THE AMERICAN RED CROSS

To support the mission of the American Red Cross, over 1.3 million paid and volunteer staff serve in some 1,600 chapters and blood centers throughout the United States and its territories and on military installations around the world. Supported by the resources of a national organization, they form the largest volunteer service and educational force in the nation. They serve families and communities through blood services, disaster services, disaster relief and preparedness education, services to military family members in crisis, and health and safety education.

The American Red Cross provides consistent, reliable education and training in injury and illness prevention and emergency care, providing training to nearly 12 million people each year in first aid, CPR, swimming, water safety, and HIV/AIDS education.

All of these essential services are made possible by the voluntary services, blood and tissue donations, and financial support of the American people.

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- Humanity
- Impartiality
- Neutrality
- Independence
- Voluntary Service
- Unity
- Universality

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Acknowledgments

The *American Red Cross HIV/AIDS Facts Book* provides the facts base for Red Cross educational efforts to prevent the spread of HIV, the virus that causes AIDS. Originally, the bulk of this material appeared as the "HIV/AIDS Facts" unit in the *American Red Cross HIV/AIDS Instructor's Manual,* published in 1990 and revised in 1991 and 1992. In 1995, the material was separated from the instructor's manual, and it became its own publication. In its current form, the Facts Book is intended for use by—

- Red Cross HIV/AIDS instructors trained in the Basic, African American, Hispanic, and Workplace HIV/AIDS programs offered by the Red Cross, as they facilitate HIV/AIDS education sessions in their communities.
- The general public, as it seeks to understand the facts about HIV and AIDS and to have its questions answered.

This Facts Book was developed by the American National Red Cross, Office of HIV/AIDS Education, with Mark Robinson, Vice President, Chapter Operations, and Carolyn Branson, Manager of HIV/AIDS Educational Development. Karen J. Peterson, Ph.D., headed up the development team consisting of Eileen Roy, M.A., and Melissa Werner, M.P.H. Beth Rosenfeld served as editor and Mactronics as production specialist.

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With other elements of the Red Cross Basic HIV/AIDS Program, an earlier version of this Facts Book was field-tested in the spring and summer of 1994 at the Alexandria Chapter, Alexandria, Virginia; Mile High Chapter, Denver, Colorado; St. Louis Bi-State Chapter, St. Louis, Missouri; and Heart of Texas Area Chapter, Waco, Texas.

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Introduction

We have been living with AIDS since 1981, when we first began to hear of rare cancers and illnesses in people whose immune systems had lost much of their power. As a society, we are living with the effects of AIDS (a result of HIV infection) on public health, medical care, law, government, and the workplace. We live with the effect that AIDS has on our families and loved ones, our friends, and ourselves. Although medical treatments improve, experts believe that a cure or vaccine is still years away. If we are to slow the spread of HIV, clearly we must educate people and encourage them to act on what they know.

The American Red Cross has a significant role to play in HIV/AIDS education. Because many people trust the Red Cross to be a neutral and impartial source of help, information, and training, the organization can contribute to increasing the public's understanding of HIV and AIDS. In the past, the Red Cross has responded to other public health challenges, including the tuberculosis and influenza epidemics in the early years of this century and the polio epidemic in the 1940s and 1950s. The Red Cross is now responding to the challenge of HIV and AIDS.

The goal of Red Cross HIV/AIDS education is to prevent the spread of HIV by—

- Encouraging people to respond in informed ways to the risk of HIV infection as well as to people who have HIV.
- Helping people to apply the facts about HIV to their own behavior.

This Facts Book is a major tool in Red Cross HIV/AIDS education. Designed to be a user-friendly source of basic information about HIV and AIDS, this book presents the information in a question-and-answer format. The questions use words the lay public (rather than the experts) might use. For example, one question reads, "Can I get AIDS from giving blood?" The answer first reminds you that AIDS is a result of HIV infection and then explains why giving blood in the United States does not pose a risk of HIV infection. If you are a Red Cross HIV/AIDS instructor, or if your work includes answering HIV-related questions, the format of this book helps you bridge the gap between knowing the facts and responding to questions that people in the community are likely to ask. If you want to learn more about HIV and AIDS for other reasons, the format will help you quickly locate what you want to know.

Each question has both basic and detailed answers offering different levels of response. The basic answer includes enough information to answer the question. The detailed answer provides more background, including an overview of research related to the question. If you are a Red Cross instructor, the two types of answers will help remind you to fit the way you answer a question to the needs of the person asking it.

Later in this introduction, you will find a list of the questions about HIV and AIDS that are included in this book. These questions fall into eight chapters, which present the information as follows:

- Chapter 1: Essential Facts About HIV and AIDS*
- Chapter 2: More Facts About the Virus
- Chapter 3: More Facts About Transmission and Prevention
- Chapter 4: More Facts About Testing
- Chapter 5: More Facts About Blood Supply and Related Issues
- Chapter 6: More Facts About Children With HIV Infection
- Chapter 7: More Facts About Social Impact of HIV Infection
- Chapter 8: More Facts About First Aid, CPR, and Aquatics

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* This chapter contains the facts that most people ask about and provides a facts base for training Red Cross instructors in the Basic, African American, Hispanic, and Workplace HIV/AIDS programs.

Immediately following the list of questions is a short section called "Key to Using the Facts Book."

This Facts Book has several other useful features:

- A glossary
- A bibliography with full citations for the sources noted in every answer
- Some supplemental materials—
  - — A list of HIV-related drugs in development
  - — Advice from the Centers for Disease Control and Prevention (CDC) for people who inject illicit drugs
  - — Recommendations on how to use bleach to clean needles and syringes
  - — An article from the CDC on latex condoms
  - — Information from the National Institutes of Health (NIH) on how HIV causes AIDS

Our knowledge about HIV and AIDS continues to expand. Although the basic facts about transmission and prevention remain the same, researchers continually add to their understanding of the virus itself, developing more sensitive tests, finding more and better ways to interrupt viral reproduction, and so on. A publication on HIV and AIDS, therefore, faces the certainty that new information will become available after the publication goes to print. This Facts Book is no exception. It may be that in the near future, for example, the research on female condoms will be completed and will show that they also are effective in preventing the sexual transmission of HIV. It may be, as well, that additional tests to detect the presence of HIV will be licensed for use by the Food and Drug Administration (FDA). The potential for new information about HIV and AIDS underscores the need for you to be familiar with credible, easily available sources that can give you the latest information. Here are some major ones:

- CDC National AIDS Hotline (800/342-AIDS); Spanish (800/344-7432); TTY/TDD (800/243-7889)
- CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org
- CDC Voice and Fax Information System (888/232-3228)
- CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap

The American Red Cross is committed to stopping the spread of HIV. We hope that this *American Red Cross HIV/AIDS Facts Book* will help you understand how to protect yourself and others from HIV. If you are interested in becoming an HIV/AIDS instructor in your community, contact your local Red Cross chapter or station for information.

The concept of prevention is important for this Facts Book. In daily life, some people use "prevention" to mean that an action is "100 percent effective" in stopping something from happening. People also use "prevention" to mean doing something that will reduce the risk of an undesired outcome. For example, people take the action of brushing their teeth to prevent tooth decay. However, they know that some tooth decay may occur even with their best efforts, though brushing will certainly reduce the possibility.

Accepted public health practice also recognizes a range of prevention behavior. This manual follows that practice, using "prevention" to refer to a variety of ways in which people can stop the spread of HIV. These ways include the most effective, such as not having sex, and other ways to reduce the risk of transmission, such as using latex condoms. Prevention behavior covers all the ways that people can act to protect themselves and others from HIV. Understanding risk reduction as one part of HIV prevention is essential to Red Cross HIV/AIDS education in the community.

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Key for Using the Facts Book

Bold-faced questions are worded as people in the community might ask them.

DETAILED: This column answers the question in more detail, often giving statistics and information about the research that forms the basis of the answer. If you are a Red Cross instructor, use it to learn about the research behind the information given in the basic answer. Use it also to respond to people who want more background and detail as you answer their questions.

BASIC: The outside column answers the question in a simple, straightforward way. If you are a Red Cross instructor, use it to review basic information or to respond to people who need basic answers to questions.

Sources: The source line identifies well-respected and authoritative sources of information and research on HIV and AIDS from which the above answers are derived. Check the bibliography of this manual for complete reference citations.

Because some statistics change rapidly, you will need to call the CDC National AIDS Hotline or the CDC National Prevention Information Network regularly to obtain current figures. This line provides telephone numbers and Website addresses for these resources. Under questions related to clinical drug trials, referral numbers and Website addresses for information about trials are also given.

1 Essential Facts About HIV and AIDS

The Virus

What is HIV?

DETAILED: HIV (human immunodeficiency virus) is the virus that causes AIDS. The virus spreads from person to person through blood-to-blood and sexual contact. People with HIV have what is called HIV infection; many will eventually develop AIDS as a result of their HIV infection.

Scientists in France identified HIV (the virus that causes AIDS) in 1983. Soon after, American scientists also identified it. The French called the virus LAV (lymphadenopathy-associated virus), whereas the Americans called the virus either HTLV-III (human T-cell lymphotropic virus-III) or ARV (AIDS-related virus). Upon comparing the viruses, scientists found they were actually the same. Later, the name of the virus was changed to HIV (human immunodeficiency virus).

Since HIV was first identified, scientists have learned that it is a "family" of closely related members. Several different groups (or clades) of the virus have been found. Although there are some differences in genetic make-up between the groups, all are recognized as HIV (or, more precisely, HIV-1). In 1985, scientists identified a second type of HIV, referred to as HIV-2. As is the case with HIV-1 (usually called HIV, the virus that causes AIDS), HIV-2 can destroy the body's immune system. However, the rate of transmission of HIV-1 may be higher than that of HIV-2, and people who have HIV-1 may develop AIDS earlier than people with HIV-2.

Certain body fluids of an HIV-infected person can spread the virus: blood, semen, vaginal fluid, and breast milk. If other body fluids contain visible blood, they can also spread the virus.

BASIC: HIV is the virus that causes AIDS (a result of HIV infection). The virus was identified in 1983.

Sources: Centers for Disease Control and Prevention. "Human Immunodeficiency Virus Type 2." April 1998.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Journal of the American Medical Association, 1996; vol. 275, no. 3. "The Emerging Genetic Diversity of HIV: The Importance of Global Surveillance for Diagnostics, Research, and Prevention." Hu, D.J., et al.
AIDS, 1994; vol. 8 (suppl. 1). "Epidemiology and Natural History of HIV-2." Kanki, P.J., and De Cock, K.M.
National Academy of Sciences. *Confronting AIDS: Update 1988.* 1988.

What is AIDS?

Basic: AIDS is a condition that results from HIV infection. The infection is caused by a virus (HIV). By the time people with HIV develop AIDS, their immune systems have become damaged and may no longer be able to fight off other infections. Although treatments for HIV infection, including AIDS, have greatly improved, these infections may eventually lead to death.

Detailed: AIDS (acquired immunodeficiency syndrome) is a condition that results from HIV infection. The infection is caused by a virus known as human immunodeficiency virus (HIV). By the time people with HIV develop AIDS, the virus has damaged their immune systems. Thus, they are vulnerable to diseases that most healthy people usually resist or control, such as certain pneumonias and thrush, or recurrences of childhood infections. They may also suffer from cancers rarely found among people with healthy body defenses. Because the virus can enter the brain and other organs throughout the body, people with AIDS may have trouble with movement, memory, and body functions.

Good medical care can dramatically extend life and improve the quality of life for people with HIV infection, including people with AIDS. There is a growing number of drugs that attack HIV itself. Doctors combine these drugs, which keep HIV from multiplying, to protect the immune system. Also, there are drugs that can treat or even prevent many illnesses that people with AIDS may get. People with AIDS die not only because they have HIV, but also because they cannot survive infections their weakened immune systems allow to develop.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Where did AIDS come from?

Detailed: AIDS is a result of infection caused by a virus, HIV (human immunodeficiency virus). Scientists look for evidence of the origin of HIV by comparing its genetic information (the genome) to that of other viruses. Scientists have learned that HIV is similar to other viruses in the world and that it is most similar to SIV (simian immunodeficiency virus), a virus that infects monkeys and other primates in West and Central Africa. Scientists know that viruses can spread from one host to another, but they may never know how people became the host for HIV.

SIV does not cause disease in African monkeys. By studying how hosts infected by related viruses have resisted illness, scientists may develop effective vaccines and treatments against HIV. Although there may be benefits from these genetic studies in the future, it is important now for everyone to apply the facts about how HIV is and is *not* spread and to understand that people with AIDS need care.

Basic: AIDS is a result of infection caused by a virus (HIV). Scientists have learned that HIV is similar to other viruses in the world and that it is most similar to SIV (simian immunodeficiency virus), a virus that infects monkeys and other primates in West and Central Africa. To prevent HIV infection, it is important to know how HIV is and is *not* spread and to apply this knowledge to one's behavior.

Sources: Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Goudsmit, J. *Viral Sex: The Nature of AIDS.* 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Origins and Diversity of Human Immunodeficiency Viruses." Sharp, P.M., et al.
Institute of Medicine. *Emerging Infections: Microbial Threats to Health in the United States.* Lederberg, J., et al., eds. 1992.

When was the first case of AIDS in the United States?

Detailed: Doctors in Los Angeles and New York reported unusual cases of *Pneumocystis carinii* pneumonia and Kaposi's sarcoma in 1981. The Centers for Disease Control and Prevention (CDC) then began tracking a growing number of young men, women, and babies who suffered from these illnesses and whose immune systems were nearly destroyed. Their condition was not referred to as AIDS, however, until late 1982. Scientists have found evidence that the disease existed in the world for some years before it was recognized in 1981.

Basic: The first AIDS cases in the United States were reported in 1981, but the illness was not referred to as AIDS until 1982.

Sources: *Nature,* 1998; vol. 391, no. 5. "An African HIV-1 Sequence from 1959 and the Implications for the Origin of the Epidemic." Letters to *Nature.* Zhu, T., et al.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Goudsmit, J. *Viral Sex: The Nature of AIDS.* 1997.
Scientific American, 1988; vol. 259, no. 4. "The Epidemiology of AIDS in the U.S." Heyward, W., and Curran, J.

How many people in this country have AIDS?

BASIC: As of December 1997, there were 641,086 reported cases of people with AIDS in the United States. This number does not include people who had HIV but had not developed AIDS.

DETAILED: AIDS is a result of HIV infection. As of December 1997, there were 641,086 reported cases of people with AIDS in the United States. There are many more people who have HIV infection only than people with HIV who have developed AIDS: between 650,000 and 900,000 people are estimated to be infected with HIV. Although it may take many years for AIDS to develop, researchers currently believe that most people with HIV will develop AIDS eventually.

Since the early years of the epidemic, the number of new AIDS cases increased each year until 1996, when the number of new cases reported dropped 6 percent from 1995. Also, deaths among people reported with AIDS in 1996 declined 23 percent from 1995. Experts think that these declines show the benefits of improved HIV/AIDS treatments.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 37. "Update: Trends in AIDS Incidence—United States, 1996."
Journal of the American Medical Association, 1996; vol. 276, no. 2. "Prevalence of HIV Infection in the United States, 1984 to 1992." Karon, J.M., et al.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How widespread is AIDS in the world?

DETAILED: Nearly every country in the world has reported at least one case of AIDS (a result of HIV infection). From the beginning of the epidemic in the 1980s to early 1996, the Global AIDS Project at Harvard University estimated that—

- 10.4 million adults, teenagers, and children with HIV in the world had developed AIDS. Of these, 2.4 million were children.
- 30.6 million adults, teenagers, and children in the world were infected with HIV, but had not developed AIDS. Of these, 3.2 million were children.

Many industrialized countries, including the United States, have reported thousands of AIDS cases, and urban areas of central and eastern Africa have been particularly hard hit by the epidemic. Many countries probably underreport the number of people with AIDS because these countries lack the resources to monitor and track the incidence of AIDS and HIV infection.

In 1997, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO) estimated that about 16,000 men, women, and children become infected with HIV *every day.* More than 90 percent of them live in developing countries.

If current trends continue, the Harvard project estimates that 60 million to 70 million adults in the world will have HIV by the end of the year 2000. Of these, one-half will be in Southeast Asia and one-fourth will be in sub-Saharan Africa.

BASIC: AIDS (a result of HIV infection) has been reported in nearly every country in the world.

Sources: Joint United Nations Programme on AIDS (UNAIDS) and World Health Organization (WHO). "Report on the Global HIV/AIDS Epidemic." Press release. December 1997.

Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.

What is the immune system?
Why is the immune system important?
What are antibodies?

BASIC: The immune system is a collection of cells and substances that act as the body's defense against germs and other things that make people sick. Antibodies are substances that form in the blood when germs enter the body. Antibodies usually defend against illnesses and infections, although this is not the case with HIV antibodies.

DETAILED: The immune system is a collection of cells and substances that act as the body's defense against anything foreign. When the system works as it should, white blood cells circulate in the body and attack any organisms that should not be there. Some of these blood cells attack germs directly, by engulfing them; other cells make antibodies in response to invading germs. Antibodies usually defend against illnesses and infections, although this is not the case with HIV antibodies. Because HIV can easily change parts of its genetic make-up as it replicates, it can escape attack by the body's defenses. When the immune system is damaged, it is less effective at protecting the body against illnesses and infections.

Scientists are studying how the immune systems of some HIV-infected people, known as "long-term nonprogressors," can continue to mount an effective defense against the virus for many years.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institutes of Health. *The Immune System—How It Works.* NIH Publication 92-3229. June 1992.

What happens when someone gets the virus that causes AIDS?

DETAILED: HIV (the virus that causes AIDS) attacks the body's defenses. After entering the body, the virus starts to damage cells (T-cells and other white blood cells) that defend against infection. Without these cells, the body's defenses (the immune system) cannot function properly. The virus multiplies and starts to infect organs throughout the body, damaging other body systems.

A few weeks after infection, people with HIV often develop symptoms similar to those of flu or mononucleosis. This period of discomfort may last a week or so. Thereafter, they may be free of symptoms. They may also have severe or prolonged fevers, lymph glands that stay swollen, lingering fatigue, and persistent night sweats.

According to a long-term San Francisco study, about half of those with HIV develop AIDS within 10 years of becoming infected. After 12 years, 65 percent develop AIDS, while 35 percent remain at high risk for AIDS. However, powerful new combination treatments that include protease inhibitors have been shown to slow the pace of infection in people with HIV, extending life and improving the quality of life for many.

Once people with HIV develop AIDS, they may get illnesses that healthy people usually resist and may experience motor and memory difficulties, wasting syndrome (unintended weight loss and diarrhea), and general weakening of body functions. However, with good medical care, people who have HIV can now be expected to live for several years after being diagnosed with AIDS.

BASIC: HIV (the virus that causes AIDS) attacks the body's defenses. People with HIV may be free of symptoms; however, they may develop severe or prolonged fevers, swollen lymph glands, diarrhea, and other symptoms. After some time, many develop AIDS (a result of HIV infection), making them susceptible to diseases that most healthy people resist.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Buchbinder, S., et al. "Healthy Long-Term Positives: Men Infected With HIV for More Than 10 Years With CD4 Counts of 500 Cells." Presented at the 8th International Conference on AIDS, Amsterdam, The Netherlands, July 19–24, 1992.

Does everybody with HIV get AIDS?

Basic: Since 1992, scientists have estimated that about half the people who have HIV will develop AIDS within 10 years after becoming infected. However, protease inhibitors used in combination with other antiviral drugs have brought dramatic results, by suppressing the ability of HIV to replicate. These treatments can extend life and improve the quality of life for many people with HIV.

Detailed: Since 1992, scientists have estimated that about half the people who have HIV will develop AIDS within 10 years after becoming infected. This estimate came out of a study, which began in San Francisco in the 1970s. Blood samples were collected to study hepatitis B in men who had sex with men. About 10 years after becoming infected, half the men with HIV had been diagnosed with AIDS.

Scientists are finding clinical and laboratory markers to help gauge the effect of the virus on the body's defenses and to help predict the development of disease. One important marker is the T-cell count, which gives a picture of the strength (or weakness) of the body's defenses. As the T-cell count decreases, the possibility of illness increases. Another important marker is the viral load test, which is a measure of how much HIV RNA can be found in the blood. As the viral load increases, the chance of illness increases. The viral load test is also used to help make decisions about treatment.

Some people with HIV develop AIDS quickly, within a few years of becoming infected; most take many years. A few others, known as "long-term nonprogressors," show no signs of AIDS for more than 7 years (even without treatment). Some nonprogressors have normal T-cell counts, but others may have low but stable counts.

Since the epidemic began, scientists have found drugs that act against HIV by slowing the pace of infection. The first of such antiviral drugs was AZT (zidovudine). More recently, protease inhibitors used in combination with other antiviral drugs have brought dramatic results, by suppressing the ability of HIV to replicate. These treatments can extend life and improve the quality of life for many people with HIV.

Antiviral treatments, however, are complex and require great cooperation from people who get them. Sometimes people may no longer respond to a drug they have taken for some time, because the virus has become resistant. Sometimes people can no longer tolerate a drug. Scientists and researchers continue to look for new treatments.

In the meantime, scientists emphasize that people who have HIV are considered able to infect others even though they may look and feel fine.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

AIDS, 1994; vol. 8 (suppl. 1). "Long-Term Survivors of HIV-1 Infection: Definitions and Research Challenges." Schrager, L.K., et al.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How long does it take for someone who is infected with HIV to develop AIDS? What is the incubation period for AIDS?

DETAILED: Since 1992, scientists have estimated that about half the people with HIV (the virus that causes AIDS) develop AIDS within 10 years after becoming infected. Also, some research shows that it may take more than 15 years for people to develop AIDS if they were younger than 35 when they became infected with HIV. The time between becoming infected with HIV and developing symptoms of AIDS ("AIDS-defining" conditions) is known as the incubation period. However, combination treatments that include protease inhibitors have been shown to slow the pace of infection in some people, extending life and improving its quality. Also, a few people (called "long-term nonprogressors") have lived with HIV for more than 7 years, developing no symptoms of AIDS even though they have not been treated. Researchers are trying to find out what keeps nonprogressors illness-free. Before developing symptoms of AIDS, people with HIV can look and feel healthy. They may not know they have HIV unless they have been tested. Scientists emphasize that even people who respond well to combination therapy should be considered able to infect others through blood-to-blood or sexual contact and should be encouraged to adopt and maintain prevention behavior.	BASIC: Since 1992, scientists have estimated that about half the people who have HIV (the virus that causes AIDS) will develop AIDS within 10 years after becoming infected. The time between becoming infected with HIV and developing symptoms of AIDS is known as the incubation period. However, combination treatments that include protease inhibitors have been shown to slow the pace of infection in some people, extending life and improving its quality.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Lancet, 1996; vol. 347. "Importance of Age at Infection with HIV-1 for Survival and Development of AIDS in UK Haemophilia Population." Darby, S.C., et al.

Buchbinder, S., et al. "Healthy Long-Term Positives: Men Infected With HIV for More Than 10 Years With CD4 Counts of 500 Cells." Presented at the 8th International Conference on AIDS, Amsterdam, The Netherlands, July 19–24, 1992.

How is AIDS diagnosed?

BASIC: AIDS is a result of infection caused by a virus (HIV). Doctors look for signs of HIV by ordering special tests. Before making an AIDS diagnosis, doctors count the number of T-helper cells (a type of white blood cell) in the blood, a measure of how strong the immune system is. A T-cell count of less than 200 indicates AIDS. Doctors also look for other signs that the body's defenses are damaged—for example, cancers or illnesses that usually attack only people whose defenses are not working.

DETAILED: AIDS is a result of infection caused by a virus (HIV). According to the Centers for Disease Control and Prevention (CDC), a diagnosis of AIDS is made if someone is HIV-positive and has either—

- A T-helper cell count below 200 or a T-helper cell percentage below 14, *or*
- The likely or confirmed appearance of certain severe illnesses (such as *Pneumocystis carinii* pneumonia or tuberculosis) or cancers (such as Kaposi's sarcoma or invasive cervical cancer).

In a very small percentage of cases in which an HIV-antibody test may not be possible, an AIDS diagnosis can be made based on evidence of a weakened immune system, with HIV infection as the only possible cause, and the presence of certain severe illnesses or cancers.

Doctors often use a combination of laboratory tests and medical examinations to determine whether a person has AIDS. Some laboratory tests doctors use include the following:

- Counting the various types of white blood cells the person has
- Checking the response to skin tests for common germs to assess the strength of the immune system
- Studying the cancerous nature of fragments from skin sores
- Checking for the presence of germs in tissue samples taken from the lungs
- Checking for other infections from fluid or tissue samples

By studying the blood and the body through laboratory tests, physical examination, and x-ray and other imaging techniques, doctors can tell whether a person with HIV has AIDS. Sometimes, however, a doctor cannot perform definitive laboratory tests because of a patient's condition. In such cases, the doctor can still diagnose AIDS if the patient has clinical signs of certain opportunistic infections and has tested positive for signs of HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992; 2nd ed., 1988.
Centers for Disease Control and Prevention. *MMWR,* 1992; vol. 41, no. RR-17.

How can I tell if I have the virus that causes AIDS?

Detailed: To find out if they have HIV (the virus that causes AIDS), people can get counseled and tested. It is not enough to check the body for signs or symptoms, because some of these may not show up for months or even years. Also, some symptoms may indicate illnesses not related to HIV.

The EIA (enzyme immunoassay, formerly called the ELISA) is a laboratory test in which a sample of blood or fluid from the mouth is used to determine whether people have antibodies to HIV. If these antibodies are present, it usually means that a person has HIV. If results show that HIV antibodies are present, a confirmatory test, such as a Western blot, should be done.

The EIA continues to be the standard screening test for HIV infection. At present, tests that detect the virus itself are used mainly for research; however, the p24 antigen test has been added as an interim measure to tests, including the EIA and the Western blot, that protect the nation's blood supply.

If people do have the virus, their bodies usually take up to three months to develop antibodies that are detectable by current tests. (The average time is 25 days.) If people think they were recently exposed to the virus, they may wait three months (and avoid taking any HIV-related risks) and then get counseled and tested. If their test results are positive, they will benefit from seeing a doctor. Doctors now have many treatments that help protect the health of people with HIV, including combination therapy that suppresses the replication of HIV and delays the onset of illness.

Regardless of their test results, people can protect themselves and others by applying the facts about HIV to their own behavior.

Basic: People can find out if they have HIV (the virus that causes AIDS) by getting counseled and tested. Using a sample of blood or fluid from the mouth, EIAs (enzyme immunoassays, formerly called ELISAs) can show whether people have antibodies to HIV (the virus that causes AIDS). If the tests show that people have HIV antibodies, it is assumed that they have HIV infection.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

How can I tell if someone has AIDS?

BASIC: Usually, people can't tell. People with AIDS (a result of HIV infection) or HIV (the virus that causes AIDS) often show no outward signs of infection.

DETAILED: Usually, people can't tell. Because people who have HIV (the virus that causes AIDS) may show no symptoms for a long time, it is often difficult to tell from their physical appearance if they have HIV. Unless they are currently fighting opportunistic infections or have tuberculosis or Kaposi's sarcoma, people with AIDS (a result of HIV infection) may look well.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

How long does the virus survive outside the body?

BASIC: Although HIV (the virus that causes AIDS) can live outside the body for a few hours in certain body fluids, it cannot function when dry. The virus cannot infect someone unless it enters the body.

DETAILED: Scientists at the Centers for Disease Control and Prevention (CDC) have found that as body fluid containing HIV (the virus that causes AIDS) dries, 90 to 99 percent of the virus becomes disabled. HIV does not survive very long outside the body, and chemical germicides are effective against it. The virus cannot infect someone unless it enters the body. There is no evidence that anyone has become HIV-infected from exposure to HIV in the environment.

Sources: Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 2S.

What is an opportunistic infection?

DETAILED: Opportunistic infections occur when the immune system doesn't work normally. HIV (the virus that causes AIDS) damages the immune system over time, weakening its defenses against disease. When people with AIDS develop infections that people with healthy immune systems usually resist, they tend to suffer from illnesses caused by fungi, parasites, viruses, and bacteria, which are able to multiply after invading the body.

For many such infections, however, drugs are available for treatment or prevention. Even so, most people with AIDS die because their bodies are weakened from repeated infections.

BASIC: An opportunistic infection is an illness that occurs only when someone's immune system isn't working normally. When the body is in a weakened state, germs can invade the body and multiply.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
HIV/AIDS Treatment Information Service. *Glossary of HIV/AIDS-Related Terms,* 2nd ed. March 1997.

Why do people with AIDS get opportunistic infections?

DETAILED: Over time, HIV (the virus that causes AIDS) damages the immune system. When people with HIV develop AIDS (a result of HIV infection), the immune system may be so weak that it stops functioning. The immune system has two parts: one part makes substances to attack germs and the other engulfs and destroys these germs. HIV infects the cells of the second part of the immune system.

Regularly functioning immune systems can resist or control opportunistic infections, whereas damaged immune systems cannot. For example, people with AIDS are vulnerable to certain fungi (such as the ones that cause oral thrush and *Pneumocystis carinii* pneumonia) and parasites (such as the one that causes toxoplasmosis). Certain opportunistic infections are among the clinical conditions that indicate AIDS. People with AIDS often suffer from a series of persistent infections, surviving one only to get another.

Because drugs for many opportunistic infections have improved, many infections can now be prevented or treated.

BASIC: Over time, HIV (the virus that causes AIDS) attacks and weakens the immune system. The body then loses its ability to attack germs. At that point, germs can take advantage of the body's weakened state and cause infections in people with AIDS (a result of HIV infection).

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no RR-12. "1997 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

What is tuberculosis?
What does HIV have to do with tuberculosis?

BASIC: Tuberculosis (TB), a disease caused by mycobacteria, usually affects the lungs. TB can, however, affect other parts of the body. Not everyone who is infected with TB germs develops TB disease. However, people who have both HIV and TB infection are more likely to develop TB disease than people who have TB infection only. When people with TB disease cough, speak, sneeze, or sing, others who share the same air may be at risk for TB infection. There are medications that prevent TB infection from progressing to TB disease and that cure TB disease, if taken as directed.

DETAILED: Tuberculosis (TB), a disease caused by mycobacteria, usually occurs in the lungs; however, it can also occur in other parts of the body. General signs and symptoms of TB include fatigue, loss of appetite, loss of weight, fever, and night sweats. Pulmonary TB (tuberculosis in the lungs) also causes chest pain and coughing. People with pulmonary TB may cough up sputum and may sometimes cough up blood.

For many years, the rate of TB disease in the United States decreased steadily. By the mid-1980s, however, the rate began to climb again in some parts of the country, among them New York City. Since 1993, the national rate has decreased, although in some areas, the rate is still increasing.

Not everyone who is infected with TB germs develops TB disease. In the United States, most people who are infected never have any symptoms of TB disease. To keep themselves from getting TB disease, people who have TB infection take medication (usually a single drug, isoniazid) for at least six months. People who have TB disease, however, need to take several medications for at least six months.

TB germs are spread through the air. When people with TB disease cough, speak, sneeze, or sing, others who share the same air may be at risk for TB infection.

Because HIV (the virus that causes AIDS) weakens the immune system, people who have both HIV and TB infection are more likely to develop TB disease than people who have only TB infection. Given the link between HIV and TB, public health experts agree that good health care for people with HIV includes screening for TB.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Public Health Association. *Tuberculosis and HIV Disease.* Special Initiative on AIDS. November 1992.
Centers for Disease Control and Prevention. *Tuberculosis Trends: Progress Toward Elimination.* No date.

For information on tuberculosis (TB), contact the CDC Voice and Fax Information System (888/232-3228), the CDC National Prevention Information Network (800/458-5231), or the CDC Division of Tuberculosis Elimination Website at www.cdc.gov/nchstp/tb/dtbe.html.

I've heard of something called "multi-drug-resistant tuberculosis." What is that?

DETAILED: Multi-drug-resistant tuberculosis (MDR-TB) disease occurs when TB germs become resistant to the drugs used to treat TB. In the early 1990s, an outbreak of MDR-TB disease occurred in several hospitals and correctional facilities. The Centers for Disease Control and Prevention (CDC) studied the cases and reported that most patients had TB germs that were resistant to the two most-effective drugs used to treat TB (isoniazid and rifampin), and some patients had TB germs that were resistant to other drugs as well. Most of these patients also had HIV (the virus that causes AIDS). Many of them died.

People who are at risk for MDR-TB disease include—

- Those who have been recently exposed to TB germs that are resistant to TB drugs. People with damaged immune systems are especially vulnerable.
- TB patients who did not take their medicine as directed.
- TB patients whose doctors prescribed an ineffective treatment.
- Anyone who has been treated for TB in the past.

Usually, MDR-TB disease can be prevented by treating TB patients with four drugs, which are taken as health care workers watch. This is called *directly observed therapy* (DOT).

BASIC: Multi-drug-resistant tuberculosis (MDR-TB) disease occurs when TB germs become resistant to the drugs used to treat TB. Usually, MDR-TB disease can be prevented by treating TB patients with four drugs, which are taken as health care workers watch.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Public Health Association. *Tuberculosis and HIV Disease.* Special Initiative on AIDS. November 1992.
Centers for Disease Control and Prevention. *MMWR,* 1992; vol. 41, no. RR-5.

For information on tuberculosis (TB), contact the CDC Voice and Fax Information System (888/232-3228), the CDC National Prevention Information Network (800/458-5231), or the CDC Division of Tuberculosis Elimination Website at www.cdc.gov/nchstp/tb/dtbe.html.

Are drugs for AIDS available?

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). There is a growing number of drugs that can attack HIV itself. Currently, doctors combine these drugs to block the ability of HIV to multiply, thus protecting the immune system for some time. Many other available treatments fight the opportunistic infections that people with AIDS develop.

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). There is a growing number of drugs that can attack HIV itself. Currently, doctors combine these drugs to block the ability of HIV to multiply, thus protecting the immune system for some time. Since 1987, when the Food and Drug Administration (FDA) approved the first antiviral drug (AZT), 11 antiviral drugs have become available, including some potent protease inhibitors. More antiviral drugs are in various stages of research and testing.

Other available treatments help control the opportunistic infections that occur in people with HIV who have AIDS when their immune systems no longer work normally. Although these treatments can prevent or lessen opportunistic infections, they do not attack HIV infection itself.

Doctors monitor both the quantity of the virus in the blood (viral load) and the level of certain cells (CD4+ T-cells) in the body's defense system to help them make treatment decisions, which sometimes are difficult.

According to the Pharmaceutical Research and Manufacturers of America, 124 treatments and vaccines for people with HIV were under development and testing as of November 1997.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Pharmaceutical Research and Manufacturers of America. *New Medicines for AIDS in Development.* November 1997.

For additional information on alternative treatments and therapy options, contact Project Inform (800/822-7422) or its Website at www.projinf.org.

What is combination therapy? What are "drug cocktails"?

Detailed: There is a growing number of drugs that attack HIV (the virus that causes AIDS) itself. Currently, doctors combine these drugs to block the ability of HIV to multiply, thus protecting the immune system for some time. When tested for viral load (the amount of HIV in the blood), many people with HIV on combination therapy have no detectable level of the virus. Current research, however, shows that HIV remains in the body.

The goal of combination therapy is to extend life and improve the quality of life for people with HIV by suppressing enough of the virus over time to avoid damage to the immune system. Although not a cure, combination therapy brings hope and new strength to many people with HIV.

Currently, three kinds of antiviral drugs are available. Each has a specific way to slow or stop the growth of HIV by making the virus incompatible with the body's cell machinery needed to make new virus.

These treatment breakthroughs have come after much research and testing. In 1987, the first antiviral drug, AZT (zidovudine), was licensed, followed by ddI (didanosine) in 1991, ddC (zalcitabine) in 1992, d4T (stavudine) in 1994, and 3TC (lamvudine) in 1995. In 1996, the first non-nucleoside reverse transcriptase inhibitor, nevirapine, was approved, followed by delavirdine. In 1996, saquinavir became the first protease inhibitor to be approved, quickly followed by indinavir, ritonavir, and nelfinavir.

Research continues into new drugs. Because HIV can change parts of itself easily, it can quickly become resistant to drugs, especially if people who have HIV do not take the drugs exactly as prescribed. People with HIV need expanded treatment choices to keep the virus at bay. Research is under way to reduce the number of pills and number of doses needed to maintain health. For example, in 1997, the FDA approved a pill combining AZT and 3TC, reducing the daily number of pills from eight to two.

In response to dramatic advances in treatment, two panels of experts reviewed what was known about HIV infection and treatment of HIV infection in 1997. The first panel outlined general principles; the second panel put these principles into practice. Their recommendations included—

- Individualized combination therapy for people with and without symptoms, including how and when to change treatment.
- Use of periodic viral load and T-cell tests to gauge how well treatment is suppressing the virus and delaying the development of disease.

As promising as combination therapy is, it is only part of the solution. Doctors do not yet know how long benefits can be maintained in people who respond well to the drugs. Some people who are on combination therapy do not get much benefit and some cannot bear the side effects. Others cannot take the drugs as prescribed. Still others cannot take them because they have no way to pay for them.

Basic: There is a growing number of drugs that attack HIV (the virus that causes AIDS) itself. Currently, doctors combine these drugs to block the ability of HIV to multiply, thus protecting the immune system for some time. Research continues to find more and better treatments.

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National Institute of Allergy and Infectious Diseases. "HIV Persists and Can Replicate Despite Prolonged Combination Therapy." News release. November 13, 1997.
U.S. Department of Health and Human Services and the Henry J. Kaiser Family Foundation. *Guidelines for the Use of Antiretroviral Agents in HIV-Infected Adults and Adolescents.* November 5, 1997.
Food and Drug Administration. "FDA Approves First Combination Drug for AIDS." Talk Paper T97-49. September 29, 1997.
Food and Drug Administration. "Rescriptor (delavirdine) Receives Accelerated Approval." No date (drug was approved April 4, 1997).
National Institute of Allergy and Infectious Diseases. "Study Confirms that Combination Treatment Using a Protease Inhibitor Can Delay HIV Disease Progression and Death." News release. February 24, 1997.
Food and Drug Administration. "FDA Approvals in 1996 Set New Records." Talk Paper T97-4. January 14, 1997.
Food and Drug Administration. "FDA Approves First Protease Inhibitor Drug for Treatment of HIV." News Release P95-10. December 7, 1995.

For information on clinical trials of experimental drugs and other therapies for adults and children, contact the National Institute of Allergy and Infectious Diseases (NIAID) AIDS Clinical Trials Information Service (800/874-2572), TTY/TDD (800/243-7012), or its Website at www.actis.org. For information on alternative treatments and therapy options, contact Project Inform (800/822-7422) or its Website at www.projinf.org.

What is the viral load test that people are talking about?
What does the T-cell count tell doctors about somebody's health?

DETAILED: Scientists are developing clinical and laboratory markers to help assess the effect of HIV (the virus that causes AIDS) on the body's defenses and to help predict the development of disease. One important blood test is the *T-cell (CD4+) count,* which gives a picture of the strength (or weakness) of the body's defenses. CD4+ T-cells play a major role in defending the body against germs; they are also a major target of HIV infection. As the T-cell count decreases, the possibility of illness increases. In 1993, the Centers for Disease Control and Prevention (CDC) added T-cell counts below 200 (or T-cell percentages below 14) to the list of AIDS indicators.

The newer *viral load test,* which uses PCR (polymerase chain reaction) technology to measure how much HIV RNA is in the blood, is used to help doctors make decisions about treatment. As the viral load increases, the chance of illness increases; as the viral load decreases, the chance of illness decreases. If combination therapy is working, a person's viral load decreases significantly. A change in load is significant if it is more than one log; for example, if a person's viral load decreases from 100,000 copies or cells per mL of plasma to 10,000 after starting combination therapy.

Used together, these tests are strong predictors of how disease might develop in people who have HIV. A 1997 study showed that people with HIV who have *low T-cell counts* and high viral loads are more likely to develop AIDS than people who have *high T-cell counts* and high viral loads.

BASIC: From the viral load test and the T-cell (CD4+) count, doctors get important information: the amount of HIV (the virus that causes AIDS) in the blood of a person with HIV and the effect of HIV on that person's immune system. The viral load test measures how much HIV RNA can be found in the blood. As the viral load increases, the chance of illness increases. The viral load test is used to help make decisions about treatment. The T-cell count gives a picture of the strength (or weakness) of the body's defenses. As the T-cell count decreases, the possibility of illness increases.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

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Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no RR-2. "1997 Revised Guidelines for Performing CD4+ T-Cell Determinations in Persons Infected with Human Immunodeficiency Virus (HIV)."

Food and Drug Administration. "FDA Approves New Test to Measure HIV Levels in Blood." Talk Paper T96-38. June 3, 1996.

Centers for Disease Control and Prevention. *MMWR,* 1992; vol. 41, no. RR-17.

Is there a cure for AIDS?

BASIC: Currently, there is no cure for AIDS (a result of HIV infection). Although combination therapy can extend life and improve the quality of life for people who have HIV, no treatment as yet has shown the ability to destroy the virus completely.

DETAILED: No cure for HIV infection (which causes AIDS) currently exists. To date, viral infections have no cures; less deadly viruses run their course, and the body returns to health. But this is not the case with HIV. The way HIV infects the body makes finding a cure particularly challenging. This is because the virus multiplies quickly, thus mutating easily, and hides in cells of the immune system as well as in other cells in the body.

A cure for HIV infection not only must keep the virus from multiplying, but also must destroy the virus in all infected cells. Because HIV embeds itself so deeply within the cells of the body, no existing drug can cure the infection it causes.

Scientists believe that it will take much more research to find a cure for HIV infection. In the meantime, they are looking for more and better antiviral treatments to control the reproduction of the virus, even if they cannot get rid of the virus entirely. Doctors now use combination treatments that can hold the virus in check, at least for some time, extending life and improving the quality of life for people who have HIV.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

National Institute of Allergy and Infectious Diseases. "HIV Persists and Can Replicate Despite Prolonged Combination Therapy." News release. November 13, 1997.

What is Kemron?
What is low-dose oral alpha interferon?

DETAILED: Kemron is a brand name of a product made from the human protein, alpha interferon, and is absorbed in the mouth in low doses. The use of Kemron to treat HIV infection has sparked controversy among researchers and the public.

In 1990, two researchers in Kenya reported promising results from using Kemron to treat certain patients who were HIV-infected. Some of these patients "serodeconverted" (tested HIV-antibody negative); others had fewer symptoms. However, further research has not confirmed these results, and some experts have questioned how the original research was done. Although some studies reveal no benefits from this treatment for people with HIV infection, others do claim benefits, which vary from study to study.

After reviewing available research, an HIV/AIDS advisory committee at the National Institute of Allergy and Infectious Diseases (NIAID) concluded in April 1992 that low-dose oral alpha interferon could not be recommended for treating HIV infection. However, some supporters spoke out concerning its effectiveness in relieving fatigue and weight loss. Also, some HIV-infected people in many communities continued to use the treatment. In 1996, NIAID sponsored a multicenter study to determine if the treatment is effective in treating symptoms of AIDS. In mid-1997, the study was closed without resolving the issue, because of low enrollment and a high dropout rate.

For some African Americans, the issue of using oral alpha interferon is a racial one: they view the white medical establishment as denying access to a useful treatment developed in Africa. This mistrust may be linked to feelings about the Tuskegee Study of syphilis conducted in the 1930s by the Public Health Service. African American men in the study were never told they had syphilis, nor were they treated with antibiotics when these became available.

Currently, alpha interferon in other forms is approved for other uses. For example, much larger doses of alpha interferon are given intravenously to treat Kaposi's sarcoma, a rare form of cancer developed by some people who have HIV.

BASIC: Kemron is a brand name for alpha interferon, a drug absorbed in the mouth in small doses. A controversial product, Kemron was developed in Kenya to treat HIV infection. Although the original study on Kemron showed promising results, other studies have been unable to confirm them.

Sources: National Institute of Allergy and Infectious Diseases. "Study of Low-Dose Oral Alpha Interferon Closes." June 13, 1997.

Hassett, J., and Mendelsohn, L. "Effect of Low Dose Oral Interferon Alfa-N3 in ARC." Presented at the 9th International Conference on AIDS, Berlin, Germany, June 6–11, 1993.

Katabira, E., et al. "Low-Dose Oral Interferon in the Management of Symptomatic HIV-1 Infection." Presented at the 9th International Conference on AIDS, Berlin, Germany, June 6–11, 1993.

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Lancet, 1992; vol. 340. "NIH Reopens the Kemron Case." Rowe, P.

East Africa Medical Journal, 1990; vol. 67, no. 7 (suppl. 2). "Efficacy of Kemron (Low-Dose Oral Natural Human Interferon Alpha) in the Management of HIV-1 Infection and Acquired Immune Deficiency Syndrome (AIDS)." Koech, D., and Obel, A.

Daedalus, 1989; vol. 118, no. 3 (part 2). "AIDS in Blackface." Dalton, H.

For additional information on alternative treatments and therapy options, contact Project Inform (800/822-7422) or its Website at www.projinf.org.

Transmission and Prevention

How is AIDS spread?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV) that spreads through sex—vaginal, oral, or anal—and blood-to-blood contact with infected people. HIV cannot spread from person to person by casual everyday contact.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV) that spreads through blood-to-blood or sexual contact with someone who has the virus. The principal ways that people become infected with HIV are through—

- Sharing needles and syringes with someone who has the virus.
- Having sex—vaginal, oral, or anal—with someone who has the virus.
- A baby's exposure to his or her infected mother during pregnancy or birth or through breast feeding.

Before testing began in 1985, some people became infected with HIV through receiving blood transfusions, blood components or blood clotting factors, or transplants of organs infected with the virus. Since 1985, testing has improved greatly, and such transmission is very rare now.

The virus does not spread from person to person by casual everyday contact, nor does it spread through the air or in water.

Sources: Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Academy of Sciences. *Confronting AIDS: Update 1988.* 1988.

Isn't AIDS a gay disease?

Detailed	Basic
DETAILED: No. AIDS (a result of HIV infection) is caused by HIV, a virus that can infect people regardless of sexual orientation. HIV can infect anyone who has sexual or blood-to-blood contact with an infected person. The virus can infect men, women, and children. Men who have sex with men or women, and women who have sex with men or women, are at risk if their partners are infected with HIV. Correct and consistent use of latex condoms, however, greatly reduces the risk of infection. Risk relates to what people do, not who they are. In many countries other than the United States, the numbers of women with HIV are nearly equal to the numbers of infected men. In these countries, HIV spreads mostly through sex between men and women. And in the United States, the number of people with AIDS who became infected through sex between men and women keeps growing.	BASIC: No. AIDS (a result of HIV infection) is caused by a virus (HIV). Anyone can get HIV through blood-to-blood or sexual contact with an infected person. Like anyone else, men who have sex with men are at risk if they have contact with an infected person's blood, semen, vaginal fluid, or breast milk.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 37. "Update: Trends in AIDS Incidence—United States, 1996."

Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Are straight people at risk for AIDS?

BASIC: Yes. AIDS (a result of HIV infection) is not a gay disease. It is caused by a virus (HIV) that can infect anyone who does not adopt prevention behavior, regardless of sexual orientation. In fact, the number of AIDS cases among adults and teenagers who have only man-woman sex keeps growing.

DETAILED: Yes. Any person, regardless of sexual orientation, can become infected with HIV (the virus that causes AIDS) through sex with someone who has the virus. Some research shows that the chances are greater for an HIV-infected man to infect a female partner than for an HIV-infected woman to infect a male partner during sex. As of December 1997, there were 58,884 reported cases of AIDS among adults and teenagers as a result of sex between men and women, or 9 percent of the total number of cases. The statistics do not include people with AIDS who have man-woman sex and other risk factors, such as injection drug use.

In the United States, the total number of people with AIDS infected through man-woman sex is lower than the total number infected through man-man sex. Nevertheless, the rate of new HIV infections among men who have sex with men is slowing, while the rate among people who have man-woman sex is increasing. In many other countries, HIV spreads mostly through sex between men and women. Indeed, in these countries, the number of women with HIV is nearly equal to the number of infected men.

To avoid infection, men and women, whatever their sexual orientation, can stop having sex (oral, vaginal, or anal) if their partners have HIV—or if they do not know their partner's HIV status. (It's hard to know for sure whether or not a sex partner has HIV.) If couples do have sex, using a latex condom the right way every time greatly reduces their risk of HIV infection. To protect themselves from HIV, people who inject drugs can seek treatment and try to stop. If they cannot or do not wish to stop, however, they should use new, sterile equipment every time they inject. They need to avoid sharing needles and syringes because these can spread HIV if a sex or needle-sharing partner is infected. If they do share needles and syringes, people can reduce their risk by cleaning them properly with bleach and water.

Sources:
Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
Centers for Disease Control and Prevention, Center for Substance Abuse Treatment, and National Institute on Drug Abuse. *HIV/AIDS Prevention Bulletin.* April 19, 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What are some common sexually transmitted diseases?

Detailed: The following are some common sexually transmitted diseases (STDs) and their symptoms:

Syphilis
Both men and women: May at first have a painless sore around or inside the genitals, anus, or mouth (primary syphilis); later, may have a rash elsewhere (secondary syphilis).

Gonorrhea
Women: Most have no symptoms; may have vaginal discharge, painful urination, spotting of blood after sex, lower abdominal pain.
Men: May have no symptoms; may have discharge from the penis or painful urination.

Chlamydia
Women: Most have no symptoms; may have vaginal discharge, painful urination, spotting of blood after sex, lower abdominal pain.
Men: About half have no symptoms; may have discharge from the penis or painful urination.

Genital warts (caused by certain human papilloma viruses)
Women: May have warts inside or outside the vagina, anus, or mouth. Warts may appear as bumps or may be flat and hard to see; they may be smooth or rough and appear alone or in groups. Warts may sometimes itch, bleed, or become irritated. If warts grow in the cervix, a woman may have no symptoms.
Men: May have warts on the tip or shaft of the penis, or around the anus or mouth. Warts may appear as bumps or may be flat and hard to see; they may be smooth or rough and appear alone or in groups. Warts may sometimes itch, bleed, or become irritated.

Herpes
Both men and women: May have no symptoms; may have small, painful, blister-like sores in and around the genitals or anus, or on thighs; may have painful urination, discharge, headache, backache, or fever.

Half of those with herpes have more than one outbreak. After the first outbreak, subsequent outbreaks may involve fewer and smaller sores and may not include headache, backache, or fever.

Trichomoniasis
Women: May have frothy, smelly green or yellow discharge from the vagina, pain when urinating, or pain during sex.
Men: Usually have no symptoms but may have discharge from the penis, pain when urinating, or itching.

Basic: Some common sexually transmitted diseases (STDs) are syphilis, gonorrhea, chlamydia, genital warts, herpes, trichomoniasis, and hepatitis B infection. Signs and symptoms of a particular STD may be different for women and men. With some STDs, people may show no symptoms. People can prevent STDs, including HIV infection, by not having sex or by using latex condoms the right way every time they do have sex.

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Hepatitis B infection

Both men and women: May have loss of appetite, nausea, vomiting, abdominal pain, fatigue, and yellowing of the skin and eyes (jaundice). Unlike the other STDs listed here, if symptoms do appear, hepatitis B infection does not show itself primarily in the genital area. Many people have no symptoms at all.

Because many STDs have no symptoms, health care providers should take a thorough sexual health history and offer appropriate STD screening. Left untreated, some STDs can lead to serious complications. For example, hepatitis B infection may lead to chronic liver disease and liver cancer. (However, hepatitis B infection is the only STD for which there is a safe and effective vaccine.)

People can prevent STDs, including HIV infection, by not having sex or by using latex condoms the right way every time they have sex.

Sources: Centers for Disease Control and Prevention. “Some Facts About Chlamydia.” Available at http://www.cdc.gov/nchstp/dstd/chlamydia_facts.htm (visited February 11, 1998).
Centers for Disease Control and Prevention. “Sexually Transmitted Diseases.” November 24, 1997.
Centers for Disease Control and Prevention. “Genital Herpes.” October 1997.
Population Reports, June 1993; series L, no. 9 (and suppl.). “Controlling Sexually Transmitted Diseases.”
Centers for Disease Control and Prevention. “Genital Warts.” Series on Sexually Transmitted Diseases. No date.

For information on sexually transmitted diseases (STDs), contact the CDC Voice and Fax Information System (888/232-3228); the CDC National STD Hotline (800/227-8922); or the Division of STD Prevention Website at www.cdc.gov/nchstp/dstd/dstdp.html. For information in Spanish, call the CDC National AIDS Hotline (800/344-7432).

Why are sexually transmitted diseases associated with getting AIDS?

Detailed: In the United States, 12 million people develop a sexually transmitted disease (STD) every year. About 3 million are teenagers. People who have had STDs are at greater risk of getting HIV (the virus that causes AIDS) than people who have never had one of these diseases. This is true for STDs (such as syphilis) that cause sores or breaks in the skin or mucous membranes and for other STDs with discharges that produce inflammation (such as gonorrhea and chlamydia).

Treating STDs can help prevent the spread of HIV. A study in Tanzania showed that effective STD treatment greatly reduces the rate of new cases of HIV infection.

Reasons for the connection between HIV infection and other STDs are—

- Increased susceptibility of people with STDs. Having an STD may make it easier for HIV to cross mucous membranes or other barriers in the genital tract. Cervical secretions in women with STDs have more T-cells (the cells that HIV infects).
- Increased infectiousness in people who have HIV infection and other STDs. More HIV is in the sexual fluids of people with HIV infection and other STDs. This makes HIV transmission to partners more likely.

Also, other factors, such as high-risk sexual behavior or suppression of the immune system, may help explain the connection between HIV infection and other STDs in people who became infected with HIV through sex.

People who contract an STD are probably not using condoms. When people have sex and do not use condoms, they may also risk becoming infected with HIV. Consistent and correct use of a latex condom greatly reduces the risk of HIV transmission during sex.

Basic: AIDS is a result of HIV infection. Sexually transmitted diseases (STDs) that cause genital sores may make it easier for HIV to enter the body and cause infection. Other STDs produce inflammation, which may increase the chances of HIV infection too. Using a latex condom consistently and correctly during sex greatly reduces the risk of HIV infection as well as other STDs.

Sources: Centers for Disease Control and Prevention. "The Role of STD Testing and Treatment in HIV Prevention." Update. April 1997.

Institute of Medicine. *The Hidden Epidemic: Confronting Sexually Transmitted Diseases.* Eng, T., and Butler, W., eds. 1997.

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U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For information on sexually transmitted diseases (STDs), contact the CDC Voice and Fax Information System (888/232-3228); the CDC National STD Hotline (800/227-8922); or the Division of STD Prevention Website at www.cdc.gov/nchstp/dstd/dstdp.html. For information in Spanish, call the CDC National AIDS Hotline (800/344-7432).

How does teen pregnancy relate to HIV infection?

BASIC: Many teenagers have sex without using latex condoms, as shown by the high rates of sexually transmitted diseases (STDs) among teens and the almost 1 million teen pregnancies each year. A young woman who becomes infected with HIV (the virus that causes AIDS) and then gets pregnant can spread the virus to her baby during pregnancy or birth or through breast feeding. A young woman in this situation faces not only her own illness but also parenthood (often single parenthood) and the possibility of caring for a baby who has HIV.

DETAILED: Many teenagers have sex without using condoms. This is shown by their high rate of sexually transmitted diseases (STDs) and the almost 1 million teen pregnancies each year. About 60 percent of these pregnancies occur in young women age 17 and younger.

Although many teens receive health and sex education, the focus is often on preventing pregnancy rather than disease. Teens who use contraception may not use barrier methods, such as latex condoms, which greatly reduce the risk of infection with HIV (the virus that causes AIDS) and other STDs. To avoid pregnancy, some young women practice anal or oral sex, both of which carry HIV risks. Some teenagers may also be at risk for HIV infection by combining alcohol and drug use with sexual activity.

A young woman who becomes infected with HIV and then gets pregnant may spread the virus to her baby during pregnancy or birth or through breast feeding. If this happens, a young woman faces not only her own illness but also parenthood (often single parenthood) and the care of a baby who has HIV.

Sources: Advocates for Youth. *Adolescents, HIV/AIDS and Other Sexually Transmitted Diseases (STDs).* October 1996.
The Alan Guttmacher Institute. "Teen Sex and Pregnancy." *Facts in Brief.* July 1996.
National Commission on AIDS. *America Living With AIDS: Transforming Anger, Fear, and Indifference Into Action.* 1991.

What are the most common ways that teenagers get AIDS?

Detailed: AIDS, a result of HIV infection, is caused by a virus (HIV). Having sex with a person who has HIV is the most common way that teenagers become infected. Among new AIDS cases in teenagers in 1997—

- 18 percent were in young men who have sex with men.
- 21 percent were in young women who have sex with men.

Also, some teenagers have become infected through sharing needles and syringes with someone who has HIV or after sexual abuse by someone with HIV.

In the past, some teenagers became infected through blood (used for transfusions) or blood products contaminated with HIV. Since 1985, all donated blood has been tested for signs of HIV. Now, people rarely get HIV from transfusions of blood or from blood components. However, because of the long period between initial infection with HIV and the development of AIDS, some teenagers who did become infected in this way before 1985 may have not yet developed AIDS. Some research shows that people who were younger than 35 when they became infected with HIV may take more than 15 years to develop AIDS. Also, powerful new combination therapy, including protease inhibitors, has been shown to slow the pace of infection in many people with HIV. These treatments extend life and improve the quality of life for many people with HIV.

Current statistics show a relatively small number of teenagers with AIDS, compared with the total number of people with AIDS. Because of the long period between HIV infection and symptoms of AIDS, however, experts believe that many people in their twenties with AIDS (almost 20 percent of all AIDS cases) became infected when they were teenagers. Thus, current AIDS statistics do not give an accurate picture of HIV infection among teenagers.

The potential impact of HIV among teenagers is great. Some teens feel invulnerable because they may not see people their own age who have AIDS. Some teenagers experiment with drugs, alcohol, and sex. Taking risks and testing limits are common ways in which teens assert their independence. They may use sexual behavior to meet needs for friendship, intimacy, and peer approval. Also, teenage girls with HIV who become pregnant can spread the virus to their babies, as can women in the same situation.

Basic: AIDS, a result of HIV infection, is caused by a virus (HIV). Today, having sex with a person who has HIV is the most common way that teenagers become infected with the virus. Also, some teenagers become infected from sharing needles and syringes with someone who has HIV. In the past, some teenagers became infected through blood (used for transfusions) or blood products contaminated with HIV. Since 1985, all donated blood has been tested for signs of HIV. Now, people rarely get HIV from transfusions of blood or from blood components.

Sources: Centers for Disease Control and Prevention. "Adolescents and HIV/AIDS." March 1998.
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National Commission on AIDS. *Preventing HIV/AIDS in Adolescents.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Are Hispanics and African Americans more likely to get AIDS?

Basic: AIDS affects us all. However, the proportion of people with AIDS in the United States who are African American or Hispanic is larger than the proportion of African Americans and Hispanics in the U.S. population.

Detailed: AIDS (a result of HIV infection) affects us all, regardless of race or ethnic background. However, the proportion of people with AIDS in the United States who are African American or Hispanic is larger than the proportion of African Americans and Hispanics in the U.S. population. For example, as of December 1997—

- 36 percent of people with AIDS were African American, although African Americans make up about 13 percent of the U.S. population.
- 18 percent of people with AIDS were Hispanic, although Hispanic people make up about 11 percent of the U.S. population.

The reasons for these imbalances are unclear. They may occur because of the impact of poverty on the lives of a large proportion of Hispanics and African Americans. People who live in poverty are affected more seriously by many diseases, including heart disease and cancer, as well as HIV infection. The higher incidence of disease may relate to unhealthy living conditions, lack of access to prevention services and medical care, feelings of hopelessness and helplessness, and the stress and despair that may result from a life of poverty. These factors may work against the adoption of prevention behavior.

In 1995, deaths from AIDS declined for the first time among all racial and ethnic groups; however, the decline was greater for white people than for African Americans and Hispanics. This may show the need for greater prevention efforts and access to treatment for African American and Hispanic communities.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46. "Update: Trends in AIDS Incidence, Deaths, and Prevalence—United States, 1996."

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

National Commission on AIDS. *America Living With AIDS: Transforming Anger, Fear, and Indifference Into Action.* 1991.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Are health care workers at risk of getting AIDS on the job?

Detailed: Not if they follow universal precautions carefully. AIDS (a result of HIV infection) is caused by a virus (HIV). It is important to remember that casual everyday contact with an HIV-infected person does not expose health care workers or people in any other profession to HIV.

For health care workers on the job, the main risk of HIV transmission is through injuries from needles and other sharp instruments that are contaminated with the virus. This risk, however, is minimal. Scientists estimate that the risk of infection from a needle jab is less than 1 percent, a figure based on the findings of several studies of health care workers who received punctures from HIV-contaminated needles or were otherwise exposed to HIV-contaminated blood. For hepatitis B, the rate is estimated to be from 6 percent to 30 percent. As of December 1997, the Centers for Disease Control and Prevention (CDC) reported 114 cases of possible job-related transmission of HIV among health care workers.

Since 1992, the Occupational Safety and Health Administration (OSHA) has had regulations for workplaces where "reasonable anticipation of exposure to blood" exists. These regulations feature procedures known as universal precautions developed by the CDC. Universal precautions cover ways to protect workers on the job (as well as patients) from bloodborne germs such as HIV and hepatitis B. The OSHA regulations require that employers provide protective gear and work protocols, training, and hepatitis B vaccine at no cost to employees.

Another approach to protecting health care workers from bloodborne germs is to design safer equipment. Current efforts include improving the design of gloves, needles and syringes, and eye wear.

Research shows that post-exposure use of antiviral treatments greatly reduces the risk of HIV transmission among health care workers exposed to HIV on the job. This use is part of current recommendations for health care workers from the Public Health Service (PHS).

Basic: Not if they follow universal precautions carefully. AIDS (a result of HIV infection) is caused by a virus (HIV). The main risk of exposure to HIV for health care workers on the job is through injuries from needles and other sharp instruments that are contaminated with the virus. This risk, however, is minimal. Scientists estimate that less than 1 percent of workers who are pricked by HIV-contaminated sharp instruments become infected with HIV.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. 22. "Update: Provisional Public Health Service Recommendations for Chemoprophylaxis After Occupational Exposure to HIV."
U.S. Department of Labor, Occupational Safety and Health Administration. *Occupational Exposure to Bloodborne Pathogens, Final Rule.* 29 CFR Part 1910.1030. December 6, 1991.

For information on occupational exposure to HIV and other bloodborne germs, contact the National Clinician's Post-Exposure Prophylaxis Hotline (PEPLine) at San Francisco General Hospital (888/448-4911).

Are patients in a doctor's or dentist's office at risk of getting AIDS?

BASIC: Not if health care workers follow universal precautions carefully.

DETAILED: AIDS is a result of HIV infection. So far, evidence indicates that although HIV transmission is possible in health care settings, it is a rare event. Medical experts emphasize that careful practice of infection-control procedures, including universal precautions, protects patients as well as health care workers from HIV infection in medical and dental offices.

In 1990, the Centers for Disease Control and Prevention (CDC) reported on an HIV-infected dentist in Florida who apparently infected some of his patients while doing dental work. In 1993, studies of viral DNA sequences linked the dentist to six of his patients, who were also HIV-infected. However, the CDC has not yet been able to establish how the transmission took place.

Further studies of thousands of patients of many health care providers with HIV have *found no further evidence* of transmission from provider to patient in health care settings. For example, one study tested 1,174 patients of an HIV-positive surgeon, who stopped doing surgery when he found out he was infected. At the time the surgeon was tested, his T-cell count was already low, a sign that he had been infected for some time. None of his patients tested positive for signs of HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Journal of the American Medical Association, 1993; vol. 269, no. 14. "Absence of HIV Transmission From an Infected Dentist to His Patients: An Epidemiologic and DNA Sequence Analysis." Dickinson, G., et al.

Journal of the American Medical Association, 1993; vol. 269, no. 14. "Absence of HIV Transmission From an Infected Orthopedic Surgeon: A 13-Year Look-Back Study." Von Reyn, C., et al.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What are universal precautions?

DETAILED: Universal precautions are guidelines to protect health care workers, as well as patients, from exposure to HIV, hepatitis B, and other bloodborne germs. Following these guidelines, health care workers treat blood, certain body fluids (including semen, vaginal fluid, and synovial fluid), and tissue from all patients as if they were infectious. The guidelines do not apply to body fluids such as sweat, tears, saliva, urine, and feces unless they contain visible blood. *Body substance isolation* guidelines cover not only bloodborne germs but other disease agents. *Standard precautions* apply both sets of guidelines to hospitals.

Under universal precautions, health care workers take certain steps when they are doing something that may bring them into contact with infected body fluids. For example, they wear protective equipment such as goggles, gowns, and latex, vinyl, or nitrile gloves to avoid exposing skin or mucous membranes to infected fluids. Other ways health care workers protect themselves include washing hands, not recapping needles by hand after an injection, disposing of needles and other sharp tools in puncture-proof containers, and wearing face masks approved by the National Institute for Occupational Safety and Health (NIOSH). These procedures also protect patients from exposure to health care workers' body fluids.

Universal precautions are in addition to other infection-control procedures for specific diseases. They also form part of the foundation for the 1992 Occupational Safety and Health Administration (OSHA) regulations covering occupational exposure to bloodborne germs.

BASIC: Universal precautions are guidelines to protect health care workers, as well as patients, from exposure to HIV and other bloodborne germs.

Sources: American Red Cross. *Emergency Response.* 1997.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Infection Control and Hospital Epidemiology, 1996; vol. 17, no. 1. "Guideline for Isolation Precautions in Hospitals."

National Institute for Occupational Safety and Health. "Changes in Occupational Safety Regulations Will Permit Better Respirators to Protect Against Dust and Disease." Press release. June 2, 1995.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

U.S. Department of Labor, Occupational Safety and Health Administration. *Occupational Exposure to Bloodborne Pathogens, Final Rule.* 29 CFR Part 1910.1030. December 6, 1991.

Centers for Disease Control and Prevention. *MMWR,* 1988; vol. 37, no. 24. "Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and Other Bloodborne Pathogens in Health-Care Settings."

For information on occupational exposure to HIV and other bloodborne germs, contact the National Clinician's Post-Exposure Prophylaxis Hotline (PEPLine) at San Francisco General Hospital (888/448-4911).

What if there is an accident at work, and blood spills on the floor? How should we clean it up?

What if there is an accident at the pool, and blood spills on the pool deck? How should we clean it up?

BASIC: People can avoid direct contact with spilled blood by wearing vinyl or latex housekeeping gloves. If there is a lot of blood, shoes can be covered with plastic. People can blot the blood from the floor with towels. They can then flood the area with a solution of one-fourth cup of liquid chlorine bleach to one gallon of fresh water. A fresh solution should be made every day. After it stands for 20 minutes, paper towels can be used to blot up the solution. All soiled items should be put in a plastic bag or biohazard container, removing gloves last. It is important to take care not to touch the outside of the gloves when removing them. People should dispose of the bag and gloves according to local health department regulations. Washing hands thoroughly with soap and water after removing the gloves is very important.

DETAILED: People can avoid direct contact with the blood by wearing vinyl or latex housekeeping gloves. Blood spills need to be cleaned immediately. If the spill is mixed with sharp objects, such as broken glass or needles, the sharp objects should not be picked up with the hands. Using tongs, a broom and dust pan, or two pieces of cardboard is a good idea. If there is a lot of blood, people can cover their shoes with plastic.

People can blot the blood from the floor with towels until the floor is clear of any visible blood. They can then flood the area with disinfectant solution (one-fourth cup of household liquid chlorine bleach to one gallon of fresh tap water) and allow it to stand for at least 20 minutes. Paper towels can be used to absorb the solution. The solution should be made fresh every day.

All soiled items should be put in a plastic bag or biohazard container, removing gloves last. It is important to take care not to touch the outside of the gloves when removing them. People should dispose of the bag and gloves according to local health department regulations. Washing hands thoroughly with soap and water after removing the gloves is very important.

People need to remember that it is difficult to spread HIV (the virus that causes AIDS) except through sexual or blood-to-blood contact. To date, no one has become infected with HIV from blood stains or spills on office or household surfaces. Also, 90 to 99 percent of the virus in fluids is destroyed in a few hours by drying.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Red Cross. *Preventing Disease Transmission.* 1996.
Centers for Disease Control and Prevention. *National AIDS Hotline Training Bulletin,* March 30, 1993; no. 38.
Centers for Disease Control and Prevention. *MMWR,* 1989; vol. 38, no. S-6. "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers."

Are condoms effective?
Don't condoms fail 10 percent of the time?

DETAILED: Used correctly and consistently, latex condoms greatly reduce the risk of infection with HIV (the virus that causes AIDS) and other sexually transmitted germs during sex.* One study of condom effectiveness observed couples in which only one partner was infected with HIV, comparing the couples using condoms consistently with those that did not. Of the 123 couples using condoms consistently, no uninfected partner became infected during the study. Of the 122 couples not using condoms consistently, 12 partners became infected with HIV.

Condoms are not 100 percent effective, however, typically because people use them improperly. For condoms to be effective, the user must—

- Store condoms in a cool, dry place out of the sun.
- Examine each condom for defects and for the expiration date before using it.
- Use a new condom for every act of oral, vaginal, or anal sex.
- Put on the condom, making sure that it is completely unrolled, before any genital contact occurs.
- Use enough water-based lubricant. Oil-based lubricants (such as cooking oil, shortening, or petroleum jelly) can weaken condoms.
- Leave enough space at the tip to collect the semen.
- Hold the base of the condom tightly against the penis while withdrawing. This must be done while the penis is still erect.

People need to use a latex condom every time they have sex, from start to finish. A new condom should be used each time they have sex.

* The Food and Drug Administration (FDA) regularly checks condoms at the manufacturer's plant. If more than 4 in a batch of 1,000 condoms break during testing, the entire batch is rejected.

BASIC: Used correctly and consistently, latex condoms help protect people from HIV (the virus that causes AIDS) and other sexually transmitted germs. Although they greatly reduce the risk of infection, they are not 100 percent effective. Condom failures usually result from improper use.

Sources: Centers for Disease Control and Prevention. "Questions and Answers about Male Latex Condoms to Prevent Sexual Transmission of HIV." Update. April 1997.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 42, no. 30.
New England Journal of Medicine, 1994; vol. 331, no. 6. "A Longitudinal Study of Human Immunodeficiency Virus Transmission by Heterosexual Partners." deVincenzi, I.
American Journal of Public Health, 1993; vol. 83, no. 4. "Commentary: Condoms and HIV/STD Prevention—Clarifying the Message." Roper, W.L., et al.
Consumer Reports, 1989; vol. 54, no. 3. "Can You Rely on Condoms?"

I've heard of a female condom. What is it?

BASIC: The female condom is made of polyurethane. Shaped like a closed tube, the female condom has a ring at each end. Unlike the male condom, the female condom allows women to protect themselves without having to convince male partners to put on condoms.

DETAILED: The female condom is made of polyurethane. Shaped like a closed tube, the female condom has a ring at each end. To use the condom, a woman puts it in her vagina; the tube then lines the vagina and covers part of the labia. The condom is held in place by the two rings, one circling the cervix and the other outside the vagina.

The Food and Drug Administration (FDA) approved the female condom for use in the United States in 1993. The FDA required that the package label stress the need for people to use the conventional male latex condom for "highly effective protection" against HIV infection and other sexually transmitted diseases (STDs). Although current research on the effectiveness of the female condom against STDs is encouraging, further research is needed.

Even so, experts consider that by providing more HIV prevention choices, the female condom may help in the fight against HIV. For women who have sex, the female condom is the first barrier method developed for use by women to help prevent HIV infection and other STDs. Unlike the male condom, the female condom allows women to protect themselves without having to convince male partners to put on condoms. Female condoms should not be used with latex condoms.

Not all women find the female condom easy or pleasant to use, nor can a woman hide the condom when it is in place. Experts are calling for development of a vaginal virucide (used like a spermicide) as an additional woman-controlled strategy against HIV.

Sources: Family Health International, AIDS Control and Prevention Project (AIDSCAP) Women's Initiative. *The Female Condom: From Research to the Marketplace.* August 1997.
Institute of Medicine. *The Hidden Epidemic: Confronting Sexually Transmitted Diseases.* Eng, T., and Butler, W., eds. 1997.
Family Planning Perspectives, 1994; vol. 26, no. 2. "Comparative Contraceptive Efficacy of the Female Condom and Other Barrier Methods." Trussell, J., et al.
U.S. Department of Health and Human Services. Statement by the Food and Drug Administration. April 27, 1993.

What is the polyurethane condom?
What is the plastic condom?

Detailed: Compared with latex condoms, polyurethane (or plastic) condoms—

- May be stronger.
- Can be used by people who are allergic to latex.
- Can be used with oil-based lubricants.
- Have not yet been fully tested to determine whether they are effective against HIV. Laboratory tests, however, show that particles as small as sperm and viruses, such as HIV, cannot pass through the polyurethane.

In 1996, the manufacturer replaced a thinner version of the polyurethane condom with a thicker one, after it was reported that breakage rates of the thinner condom were much higher than those of the latex condom.

Basic: Polyurethane (or plastic) condoms may be stronger than latex condoms. However, researchers have not yet completed studies to determine how effective polyurethane condoms are against HIV.

Sources: *AIDS Alert,* 1997; vol. 12, no. 4. "Superthin Plastic Condom Gets Thicker."
Contraception, 1996; vol. 53. "The Male Polyurethane Condom: A Review of Current Knowledge." Rosenberg, M.J., et al.
Food and Drug Administration. *Interim Labeling Requirements for Condoms Made From New Materials.* October 25, 1994.
London International Group. "London International Group Develops the Polyurethane Male Condom." Press release. August 12, 1993.

How is a dental dam used for oral sex?
How is plastic food wrap used for oral sex?

Detailed: To stop the spread of HIV (the virus that causes AIDS) during oral sex, some people use a dental dam or plastic food wrap instead of a latex condom (cut the long way to lie flat) as a barrier between a person's mouth and the partner's vagina or anus. Although no scientific studies have been done on how effective dental dams or plastic wrap may be against HIV during oral sex, some HIV/AIDS organizations suggest them as tools to encourage prevention behavior.

Generally, instructions for use are to spread a water-based lubricant on one side of the dam or plastic wrap and then place that side against the partner's vagina or anus before having oral sex.

A latex condom should be used as is (without cutting) when performing oral sex on a partner's penis.

Basic: Generally, instructions for using a dental dam or plastic food wrap are to spread a water-based lubricant on one side of the dam or plastic wrap and then place that side against the partner's vagina or anus before having oral sex. No scientific studies have been done on how effective dental dams or plastic wrap may be against HIV during oral sex.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
IMPACT AIDS. "Rubber Dams." Flyer. No date.
Sapphex-Learn. "Hotline Statement on Preventing HIV Transmission During Cunnilingus and Rimming." No date.

What are natural condoms?
How safe are natural condoms?

BASIC: Although natural condoms (made from sheep intestine) work well as a birth control method, they may not keep someone from getting HIV (the virus that causes AIDS) or other sexually transmitted germs if his or her partner is infected.

DETAILED: Natural condoms are made from part of the intestinal lining of sheep. Although these condoms are adequate for birth control, they do not offer reliable protection against germs, including HIV (the virus that causes AIDS), because—

- Natural condoms may offer uneven protection.
- The pores in natural condoms may let HIV and other small viruses pass through (although sperm are too large to pass through).

Experts recommend the use of latex condoms to prevent sexually transmitted diseases. Used consistently and correctly, latex condoms greatly reduce the risk of HIV infection through sex.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
American Journal of Public Health, 1993; vol. 83, no. 4. "Commentary: Condoms and HIV/STD Prevention—Clarifying the Message." Roper, W.L., et al.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What sexual activities are safe?

BASIC: Sexual activities that have no risk of HIV transmission include the following:

- Sex between two mutually monogamous, uninfected partners who do not share needles and syringes with anyone
- Massage
- Massaging one's own genitals (masturbation)
- Activities that do not include touching a partner's penis, vagina, or anus
- Activities that do not include sex, whether oral, anal, or vaginal

DETAILED: Sexual activities that have no risk of HIV transmission include the following:

- Sex between two mutually monogamous, uninfected partners who do not share needles and syringes with anyone
- Massage
- Massaging one's own genitals (masturbation)
- Activities that do not include touching a partner's penis, vagina, or anus
- Activities that do not include sex, whether oral, anal, or vaginal

Sources: Centers for Disease Control and Prevention. *AIDS Prevention Guide.* 1994.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can I get AIDS from kissing someone on the cheek?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV) that is not casually transmitted; therefore, kissing on the cheek is very safe. Even if a person who has HIV kisses someone else, that person's skin is a good protector against the virus. In studies of family members and friends of people with AIDS, no one has become infected from such ordinary social contact as dry kisses, hugs, or handshakes.	BASIC: Kissing someone on the cheek is very safe. AIDS (a result of HIV infection) is caused by a virus (HIV). Even if a person with HIV kisses someone else, that person's skin is a good protector against the virus.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

Can I get AIDS from open-mouth kissing?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Prolonged open-mouth kissing could damage the mouth or lips. This allows HIV to spread from an infected person to a partner through cuts, sores, or mucous membranes in the mouth. Because there could be a risk of blood contact during open-mouth kissing, the Centers for Disease Control and Prevention (CDC) recommends against doing this with a partner who has HIV. In 1997, the CDC reported a case of HIV transmission likely caused by open-mouth kissing between a man with HIV and his woman partner. After much study, researchers concluded that blood in the man's saliva most likely infected the mucous membranes in the woman's mouth. Both had gum disease that caused the gums to bleed easily, and the couple had consistently used condoms. The CDC emphasized that the far more common ways of getting HIV are through injection drug use and sex, and that there are no reported cases of HIV transmission from saliva only.	BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Because there could be a risk of blood contact during prolonged open-mouth kissing, the Centers for Disease Control and Prevention (CDC) recommends against doing this with a partner who has HIV.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 27. "Transmission of HIV Possibly Associated with Exposure of Mucous Membrane to Contaminated Blood."

Centers for Disease Control and Prevention. *National AIDS Hotline Training Bulletin,* May 25, 1994; no. 101.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can I get AIDS from performing oral sex?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Some research suggests that it is possible to get HIV through oral sex with a partner who has HIV. HIV is in the blood and semen of infected men and in the blood and vaginal fluid of infected women. When people have oral sex, they can avoid becoming infected by not touching their partners' penis, vagina, or anus with their mouths. If a partner has HIV, a person can avoid becoming infected by not having contact with the partner's semen, vaginal fluid, or blood. The risk of HIV infection increases if either partner has another STD (sexually transmitted disease). People who choose to have oral sex can use a latex barrier to protect against HIV.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). If someone has HIV, it is possible for a partner to become infected during oral sex. Blood, semen, and vaginal fluid may contain the virus. Certain cells in the mucous lining of the mouth may carry HIV into the lymph nodes or bloodstream. The risk increases if someone has cuts or sores in or around the mouth or throat.

When people have oral sex, they can avoid becoming infected with HIV (and other sexually transmitted germs) if their mouths do not touch their partners' penis, vagina, or anus (there may be small cuts around the anus). Direct contact with blood, semen, or vaginal fluid increases the risk of infection. Performing oral sex on someone who ejaculates in a partner's mouth may increase the risk of HIV transmission. The risk also increases if either partner has another STD (sexually transmitted disease). If people decide to have oral sex, they can—

- Use a latex condom on a penis. Used the right way every time, latex condoms used on the penis are highly effective against HIV and other sexually transmitted germs. Condoms are not risk-free, but they greatly lower the risk of becoming infected with HIV if a partner has the virus.
- Use a latex condom cut the long way to lie flat against a vagina or anus. Although research has not yet been done to determine the effectiveness of condoms used in this way, some HIV/AIDS organizations suggest their use on the vagina or the anus to encourage prevention behavior. Some people use plastic food wrap or dental dams for this purpose; no research has been done yet on their effectiveness if used in this way.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Annals of Internal Medicine, 1996; vol. 125. "Clinical and Epidemiologic Features of Primary HIV Infection." Schacker, T., et al.
Science, 1996; vol. 272. "SIV Data Raise Concern on Oral-Sex Risk." Cohen, J.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
American Journal of Public Health, 1990; vol. 80, no. 12. "HIV Seroconversion in Two Homosexual Men After Receptive Oral Intercourse With Ejaculation: Implications for Counseling Concerning Safe Sexual Practices." Lifson, A.R., et al.

Can I get AIDS from someone who performs oral sex on me?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). It is unlikely that someone would become infected with HIV if a partner with the virus performed oral sex on him or her. However, some experts believe that the person who receives semen or vaginal fluid may be at risk of becoming infected, because these fluids can enter cuts in the mouth. Also, certain cells in the mucous lining of the mouth may carry HIV into the lymph nodes or bloodstream. If people have oral sex, they can use a latex barrier.

If people decide to have oral sex, they can—

- Use a latex condom on a penis. Used the right way every time, latex condoms used on the penis are highly effective against HIV. Condoms are not risk-free, but they greatly lower the risk of becoming infected with HIV if a partner has the virus.
- Use a latex condom cut the long way to lie flat against a vagina or anus. Although research has not yet been done to determine the effectiveness of condoms used in this way, some HIV/AIDS organizations suggest their use on the vagina or anus to encourage prevention behavior. Some people use plastic food wrap or dental dams for this purpose; no research has been done yet on their effectiveness if used in this way.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). It is unlikely that someone would get HIV if a partner with the virus performed oral sex on him or her. However, some experts think that the person who receives semen or vaginal fluid during oral sex may be at risk of becoming infected.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Annals of Internal Medicine, 1996; vol. 125. “Clinical and Epidemiologic Features of Primary HIV Infection.” Schacker, T., et al.

Science, 1996; vol. 272. “SIV Data Raise Concern on Oral-Sex Risk.” Cohen, J.

U.S. Department of Health and Human Services. *Surgeon General’s Report to the American Public on HIV Infection and AIDS.* June 1993.

Can I get AIDS from anal sex?

Basic: Yes. Even with a condom, anal sex puts people at risk for HIV infection. If people have anal sex, they can reduce their risk by using a latex condom. Using a water-based lubricant with the condom makes the condom less likely to break.

Detailed: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). If infected with HIV, either partner can infect the other during anal sex. Generally, the person receiving the semen is at greater risk of getting HIV because the lining of the rectum is thin and may allow germs to enter the body during anal sex. However, a person who inserts his penis into an infected partner is also at risk because HIV can enter through the penis. If people plan to have anal sex, they can use a latex condom the right way every time to greatly reduce their risk of infection. Most of the time, condoms work well. When they break, it is usually because of improper use. Condoms are more likely to break during anal sex than during vaginal sex. Even with a condom, anal sex is risky. Using a water-based lubricant makes the condom less likely to break.

If one partner has HIV, a couple might consider erotic activities other than oral, anal, or vaginal sex. Remember, blood, semen, or vaginal fluid from a person with HIV can spread the virus.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can a woman get AIDS from having sex with a man? Can a man get AIDS from having sex with a woman?

DETAILED: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). A woman can get HIV during oral, vaginal, or anal sex if her partner is infected, because an infected man's semen can contain the virus. During oral, vaginal, or anal sex, an infected man's semen may enter the woman through certain cells in the mucous lining or through tiny cuts and tears in the mouth, vagina, or anus. This could cause her to become infected.

A man, also, can get HIV during oral, vaginal, or anal sex if his partner is infected and he is exposed (usually through his penis) to her blood or vaginal fluid.

Unless both people know they do not have HIV, a couple can use a latex condom the right way every time they have vaginal sex. The same is true for oral and anal sex. (To make a latex barrier for mouth contact with the vagina or the anus, a condom can be cut the long way to make it lie flat against the vagina or the anus.) Using a water-based lubricant with a latex condom makes the condom less likely to break. Some people use plastic food wrap or dental dams for this purpose; no research has been done yet on their effectiveness if used in this way.

When used the right way every time, condoms greatly reduce the risk of HIV transmission during sex. When they break, it is usually because of improper use. Condoms are more likely to break during anal sex than during vaginal sex. Even with a condom, anal sex is risky. If one partner is infected, a couple should consider erotic activities, other than sex, that do not involve contact with the vagina, penis, or anus. Remember, blood, semen, and vaginal fluid that have HIV can spread the virus.

BASIC: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). Either a woman or a man can become infected during oral, vaginal, or anal sex if the partner has HIV. When used correctly and consistently, latex condoms greatly reduce the risk of HIV transmission during sex.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *AIDS Prevention Guide.* 1994.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
IMPACT AIDS. "Rubber Dams." Flyer. No date.

Can lesbians get AIDS?

BASIC: Yes, but few cases resulting from sex between women have been reported. AIDS (a result of HIV infection) is caused by a virus (HIV). Like anyone else, women who have sex with women may become infected through injection drug use or sex with a partner (whether a man or a woman) who has HIV.

DETAILED: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). Although very rare, a few cases have been reported in which women have infected other women through sex. HIV is found in blood and vaginal fluid and in certain cells in the vaginal wall. A woman with HIV who has sex with other women can infect her partners during sex. Women who have sex with women may engage in oral sex, mutual masturbation, and oral-anal contact. They may share sexual toys. These activities may put someone at risk for HIV infection if her partner is infected. Like anyone else, women who have sex with women may become infected through injection drug use or sex with a partner (whether a man or a woman) who has HIV.

As of December 1996, 85,500 women were reported to have AIDS. Of these women, 1,648 were reported to have had sex with other women. However, most of them had other risks, such as injection drug use.

Sources: Centers for Disease Control and Prevention. "HIV/AIDS and Women who have Sex with Women (WSW) in the United States." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

How can someone get AIDS from a needle?

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV) that is spread through sexual or blood-to-blood contact. Someone can become infected from using a needle or syringe that contains blood from a person who has HIV. Because infected blood can be injected directly into the body of the next person, the person using a contaminated needle or syringe is at risk of becoming infected with HIV. Sharing needles and syringes with an HIV-infected person for any reason—such as for injecting drugs (including steroids), piercing ears and other body parts, and tattooing—can spread the virus if the needles and syringes are contaminated. There is no risk of getting HIV from unused, sterile equipment.

Although getting into treatment to get off drugs or using new, sterile equipment is more effective, people who inject drugs can reduce the risk of HIV transmission by properly cleaning needles, syringes, and other injection equipment with chlorine bleach and water. Bleach has been shown to destroy HIV in laboratory tests.

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). Because HIV can spread through blood-to-blood contact, the person who uses a contaminated needle or syringe is at risk of becoming HIV-infected. A person using a contaminated needle can inject the virus directly into the body.

Sources: Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Centers for Disease Control and Prevention, Center for Substance Abuse Treatment, and National Institute on Drug Abuse. *HIV/AIDS Prevention Bulletin.* April 19, 1993.

National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

For information on needle exchange programs, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889). For start-up assistance for new syringe programs, contact the North American Syringe Exchange Network (253/272-4857).

I clean my needles with water. Is that okay?

BASIC: No. People can get HIV (the virus that causes AIDS) if they share needles and syringes with a person who has HIV. If people cannot use a more effective method (getting off drugs or using new, sterile equipment every time), cleaning their "works" properly with chlorine bleach and water can help reduce the risk of infection.

DETAILED: No. Water does not destroy or remove all of the HIV (the virus that causes AIDS) in a needle. If people inject drugs and share needles with other people, they run the risk of getting HIV from infected blood left in the syringe or on the needle. The most effective way to prevent transmission is to stop injecting drugs. (Drug treatment programs can help people do this.) If people cannot or do not wish to stop, they can use new, sterile equipment every time they inject. If they share injection equipment, they can clean their needles and syringes correctly.

In 1993 and again in 1997, the Centers for Disease Control and Prevention (CDC) and other federal agencies gave recommendations for cleaning needles and syringes with chlorine bleach and water. Research has shown that disinfecting the equipment with bleach and water is more complicated than earlier thought. Laboratory studies showed that full-strength bleach had to remain in contact with contaminated surfaces for at least 30 seconds, much longer than the usual time that most people take. Also, bleach may encourage blood to clot, making it harder to flush out of needles and syringes. Because of these findings, people who inject drugs can use bleach and water to clean needles and syringes *when they do not have more effective choices.* The recommendations also suggest ways to enhance the cleaning method. Water alone does not destroy HIV.

Sources:
Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
Centers for Disease Control and Prevention, Center for Substance Abuse Treatment, and National Institute on Drug Abuse. *HIV/AIDS Prevention Bulletin.* April 19, 1993.
National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

What drugs are associated with getting AIDS?

DETAILED: AIDS is caused by a virus (HIV). The use of alcohol, marijuana, cocaine, crack, heroin, amphetamines, and combinations of these drugs is helping spread this virus. One such combination, known as a "speedball," is made by mixing heroin with cocaine or amphetamines. Substances that alter people's judgment increase the risk of HIV transmission by making people more likely to have sex or inject drugs. Injected drugs greatly increase the risk because they carry HIV directly into the body if an HIV-contaminated needle is used. Even though it is smoked and not injected, crack joins this list because the culture that has developed around its use often includes sex with people at risk for having HIV. Alcohol and marijuana are also included because they are widely used and can affect judgment about taking risks. It is important to remember that drugs themselves do not spread HIV; it is the activities connected with their use that could.

BASIC: The use of alcohol, marijuana, cocaine, crack, heroin, and amphetamines is associated with the transmission of HIV (the virus that causes AIDS). These drugs affect people's judgment and may lead them to engage in high-risk activities such as having sex or injecting drugs. Injected drugs greatly increase the risk because they carry HIV directly into the body if an HIV-contaminated needle is used.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention*, 4th ed. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

National Research Council. *AIDS, Sexual Behavior, and Intravenous Drug Use.* Turner, C., et al., eds. 1989.

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

Why do IV drug users share needles and syringes?

BASIC: People who inject drugs share needles and syringes for various reasons, including the following:

- It is often hard for users to buy equipment.
- In most places, it is illegal to have injection equipment.
- People buying drugs often want or need to inject them right away.

DETAILED: People who inject drugs share needles and syringes for many reasons, including the following:

- Injecting drugs is a learned behavior. When people first begin to inject, they often have no equipment and no experience. Once equipment sharing begins, it may continue simply as habit.
- Members of small drug-using groups often expect to share injection equipment.
- In most places, needles and syringes are illegal without a prescription. People can be arrested merely for having injection equipment in their possession. Thus, people may share equipment out of fear of legal consequences.
- People who buy drugs to inject usually have a strong urge to use them immediately. The buyers' discomfort from withdrawal symptoms increases their willingness to share equipment.
- Clean, unused needles are scarce, and the street price of unused needles is very high.
- Shooting galleries, for little money, rent "house works" that get used over and over. Some galleries sell needles that are said to be sterile but are in fact unclean. Thus, people may buy contaminated needles believing them to be clean.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.
National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

Can I get AIDS from someone's saliva?

DETAILED: There were no known cases of saliva by itself spreading HIV (the virus that causes AIDS) among the 641,086 people who had developed AIDS by December 1997. The possibility that saliva can spread HIV is considered only theoretical because—

- Saliva contains proteins that reduce the ability of HIV to infect cells.
- Researchers very rarely are able to isolate HIV in saliva.
- None of the hundreds of thousands of AIDS cases reported to the Centers for Disease Control and Prevention (CDC) have been attributed to transmission through saliva.
- There are only small amounts of HIV in the saliva of people with HIV, even in the saliva of people with bleeding gums or sores in the mouth.
- Studies of household (nonsexual) contact with people who have HIV have never documented the spread of HIV to others through kissing. However, there have been extremely rare cases of transmission by severe human bites, in which the infected person's saliva contained blood.

BASIC: There are no known cases of saliva by itself spreading HIV (the virus that causes AIDS). Although there is a theoretical possibility of this, much research suggests that it is highly unlikely.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 27. "Transmission of HIV Possibly Associated with Exposure of Mucous Membrane to Contaminated Blood."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *AIDS Prevention Guide.* 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What if someone with AIDS bites me? Will I get AIDS?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Some experts say that the few reported cases of HIV transmission through human bites were most likely caused by blood-to-blood contact.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). For a bite to lead to HIV infection, the following are necessary:

- The HIV-infected person biting someone must have bleeding sores or cuts in the mouth.
- The bite must cut through the other person's skin.
- Enough infected blood must enter other person's body through the bite to spread the infection.

In several different studies, scientists have followed health care workers and children who were bitten by people with HIV. From an investigation of a human biting incident, a state health department reported that the evidence suggested that HIV transmission occurred through blood-to-blood contact. Other reports in the medical literature have noted that a human bite appeared to have transmitted HIV. These reports describe the presence of blood and severe injury with extensive torn and damaged tissue. However, there are also cases of people with HIV who bit other people without spreading the virus to them. Some experts say that HIV transmission through human bites is biologically possible but unlikely. Thus, even if a person with HIV bites someone else, that person has little risk of getting HIV.

Sources: Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. "Blood-to-Blood Transmission of HIV Via Bite." Presented at the 11th International Conference on AIDS, Vancouver, British Columbia, July 7–12, 1996. Liberti, T., et al.

Lancet, 1996; vol. 347. "Transmission of HIV-1 by Human Bite." Vidmar, L., et al.

Journal of Acquired Immune Deficiency Syndromes, 1993; vol. 6, no. 4. "The Potential for Transmission of Human Immunodeficiency Virus Through Human Bites." Richman, K.M., and Rickman, L.S.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can I get AIDS from the tears of someone with AIDS?

Detailed: No. AIDS (a result of HIV infection) is caused by a virus (HIV). There is no evidence that anyone in the United States has become infected from touching the tears of a person with HIV. No health care workers, including ophthalmologists (eye doctors), who regularly come in contact with tears, have become infected from being exposed to tears. Tears contain little or no HIV. One study could find the virus in the tears of only one of seven people with HIV, and the concentration of HIV was extremely low. Based on findings from this study and others, scientists believe that tears by themselves do not pose a risk of infection.

Basic: No. AIDS (a result of HIV infection) is caused by a virus (HIV). There is no evidence that anyone in the United States has become infected with the virus from touching the tears of a person who has HIV.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Centers for Disease Control and Prevention. "AIDS Patients With No Identified Risk: Lack of Evidence for New Modes of Transmission." Poster presented at the 5th International Conference on AIDS, Montréal, Québec, June 4–9, 1989. Conley, L., et al.

Should I worry about getting AIDS from urine?
Can I get AIDS if I come into contact with feces?

Detailed: No. AIDS (a result of HIV infection) is caused by a virus (HIV). Urine and feces of a person with HIV are not considered able to spread HIV unless they contain visible blood. Several studies have tracked health care workers and school personnel who were directly exposed to the urine and feces of adults and children with HIV. There is no evidence that either the health care workers or the school personnel became infected from their exposure to urine or feces. Thus, it is highly unlikely that someone would become infected through contact with an HIV-infected person's urine or feces (unless either of these contains visible blood). Nonetheless, because urine and feces are known to spread other diseases, people should avoid direct contact with either for general health reasons and should wash their hands with soap and water immediately if they do.

Basic: No. AIDS (a result of HIV infection) is caused by a virus (HIV). Urine or feces of people with HIV have little or none of this virus unless the material contains visible signs of blood. It is highly unlikely that urine or feces would spread HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

Centers for Disease Control and Prevention. "AIDS Patients With No Identified Risk: Lack of Evidence for New Modes of Transmission." Poster presented at the 5th International Conference on AIDS, Montréal, Québec, June 4–9, 1989. Conley, L., et al.

Casual Contact

Can you get AIDS from sharing a drinking glass, dishes, public toilets or drinking fountains, telephones or public transportation, or swimming pools or from being in the same house with a person with AIDS?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). The virus is not spread through casual everyday contact. People cannot get HIV from just being around someone with HIV or from sharing utensils, office space, bathrooms, handshakes, or phones—even kisses on the cheek.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). The virus is not spread through casual everyday contact. People cannot get HIV from just being around someone with HIV. Studies of hundreds of family members and friends of people with HIV have shown that people can share utensils, office space, bathrooms, handshakes, or phones—even kisses on the cheek (to name a few) and not become infected. HIV is spread in three major ways:

- Through having sex with someone who has HIV.
- Through sharing needles and syringes with someone who has HIV.
- Through exposure (in the case of infants) to HIV before or during birth, or through breast feeding.

Since testing began in 1985, HIV has rarely been spread through infected blood, blood components, clotting factors, or donated organs.

In 1994, the Centers for Disease Control and Prevention (CDC) reported eight cases of apparent HIV transmission between people in households in which there was no sexual contact, injection drug use, or breast feeding:

- Five were associated with documented or probable blood contact.
- Two involved giving care to terminally ill AIDS patients, in which there was a possibility of blood exposure.
- One was diagnosed after his younger brother had already died of AIDS. The route of transmission was not determined.

CDC recommends that caregivers at home follow infection-control guidelines carefully to avoid exposure to blood and other infectious body fluids of a person with HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 43, no. 19.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Can you get AIDS from touching or hugging someone with AIDS?

DETAILED: No. AIDS (a result of HIV infection) is caused by a virus (HIV). The virus is not spread by hugs, touches, or massages—even casual kisses. Transmission cannot take place through any of these activities because HIV is spread by blood, semen, vaginal fluid, and breast milk. If someone has HIV, that person needs support. A hug is a wonderful way to show someone cares.

BASIC: No. AIDS (a result of HIV infection) is caused by a virus (HIV). The virus is not spread by hugs, touches, or massages—even casual kisses. HIV is spread through blood-to-blood contact or sex with someone who has the virus.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

I live with someone who has HIV. What precautions should I take?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV) that cannot be casually transmitted. People can share food, phones, dishes, clothes, and bathrooms (to name a few) without risk. People can also share swimming pools.

People should take care to avoid contact with the blood, semen, vaginal fluid, or breast milk of a housemate who has HIV. If blood is visible in any body fluid, people need to treat it as if it is blood by wearing housekeeping gloves when cleaning it up. (Rubber or plastic gloves need to be available for giving first aid for cuts or for cleaning up spills.) People can use a fresh solution of chlorine bleach and water (one-fourth cup of bleach to one gallon of water) to clean up any contaminated areas. (This is a convenient measure close to the recommended 1:100 ratio.) Other disinfectants are fine to use, but bleach is easily available and inexpensive. People should wash their hands with soap and water after removing their gloves when they have finished cleaning up a blood spill.

Because other germs can be passed through urine or feces, people should not touch a housemate's urine or feces.

BASIC: Avoid contact with the person's blood (and other body fluids possibly containing blood), semen, vaginal fluid, or breast milk. But people can share food, phones, dishes, clothes, bathrooms, and swimming pools (to name a few) without becoming infected.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *Caring for Someone with AIDS.* 1996.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 43, no. 19.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

Can I get AIDS from a mosquito or any other insect?

Basic: No. AIDS (a result of HIV infection) is caused by a virus (HIV). As of December 1997, there were no documented cases of anyone who had become infected with HIV from an insect. A mosquito bite will not give a person HIV.

Detailed: No. AIDS (a result of HIV infection) is caused by a virus (HIV) that is not spread by insects. As of December 1997, there were no documented cases of the virus being spread by an insect. Most cases of HIV infection, including AIDS, are found in men and women between the ages of 20 and 50. However, mosquitoes and insects attack people of all ages, including older people and school-age children. If mosquitoes or other insects could spread HIV, a larger number of older people and young children would have become infected. This did not happen in Belle Glade, Florida, where researchers studied the question of HIV transmission by mosquitoes, nor has it happened elsewhere.

Also, how would a mosquito infect someone? It would first have to bite an infected person. Then the mosquito would have to do one of two things:

- Immediately travel to someone else and infect that person from tiny drops of infected blood left on the sucker.
- Process the virus in its saliva and inject it into the next person.

Mosquitoes do not do either of these things. They do not travel from one person to the next. They do not carry enough blood on their suckers to infect anyone else they bite. And they do not process the virus in their saliva. Once inside a mosquito, the virus lives for only a short time. Thus, the saliva mosquitoes inject into people cannot have HIV. Bites from mosquitoes and other sucking and biting insects do not spread HIV.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. "AIDS Patients With No Identified Risk: Lack of Evidence for New Modes of Transmission." Poster presented at the 5th International Conference on AIDS, Montréal, Québec, June 4–9, 1989. Conley, L., et al.
Office of Technology Assessment. *Do Insects Transmit AIDS?* September 1987. Miike, L.

Getting Tested

Should I be tested to find out if I am infected with HIV?

DETAILED: AIDS is a result of HIV infection. People who think they are at risk of HIV infection are encouraged to seek individual counseling and testing. People are at risk of HIV infection if they—

- Share needles and syringes.
- Have sex with anyone who injects drugs.
- Have sex with men who have sex with other men.
- Have sex with multiple sex partners (including men and women who exchange sex for money or drugs).
- Received transfusions or blood components before 1985, when testing of the blood supply began.
- Received blood clotting factors before 1985.

The AIDS knowledge and attitudes supplement of the National Health Interview Survey reported that one-third of people at increased risk for HIV infection had been voluntarily tested by 1992.

An HIV test is the only way to tell whether or not someone is infected. The standard screening tests look for HIV antibodies, not the virus itself. If antibodies are present, it generally means that the person being tested has HIV.

Deciding to be tested for HIV is not always easy. Many people fear the reactions of family, friends, employers, and others if the test result is positive (shows the presence of HIV). However, antidiscrimination measures have been strengthened greatly by the Americans With Disabilities Act of 1990.

When someone has HIV, it is helpful for the person to learn as soon as possible to avoid spreading the virus to others and to see a doctor immediately. In many ways, HIV infection has become a treatable condition. Doctors can monitor the health of people with HIV and provide them with a range of treatments to suppress the virus itself and to prevent, delay, or treat opportunistic infections. Although there is no cure for HIV infection, treatments can extend life and improve the quality of life for people with HIV. Now more than ever, people benefit from knowing their HIV status.

People should not donate blood to find out if they are infected.

BASIC: People who think they are at risk of HIV infection are encouraged to seek individual counseling and testing. People can be at risk if they engage in risk behavior, such as sharing needles and syringes or having sex with someone who has HIV, the virus that causes AIDS. Standard screening tests look for HIV antibodies, not the virus itself. If antibodies are present, it generally means that the person being tested has HIV. People should not donate blood to find out if they are infected.

Sources: *Public Health Reports,* 1996; vol. 111 (suppl. 1). "CDC Data Systems Collecting Behavioral Data on HIV Counseling and Testing." Anderson, J.E.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What does confidential testing mean?
What does anonymous testing mean?
Where can I get tested?

BASIC: Some doctors, state and local health departments, and other health care professionals and organizations offer testing for HIV, the virus that causes AIDS. *Confidential testing* means that, although test results will be recorded, no one can give them out without permission of the people tested, except as required by state law. *Anonymous testing* means that names are not recorded, and only the people getting tested can find out their own test results. (Not all areas have facilities for anonymous testing.) Whichever method of testing is used, people need to get counseling both before being tested and after receiving the results.

DETAILED: Some doctors, state and local health departments, and other health care professionals and organizations offer HIV testing. There are two common methods of testing— *anonymous* and *confidential.* (Not all areas have facilities for anonymous testing, however.) Before choosing a test site, people must decide which method they wish to be tested by. The two methods differ regarding who has access to the test results. If people decide to be tested confidentially—

- Their test results are linked to their identities and recorded in their medical files held by the medical or public health facilities where the tests were taken.
- Test results cannot be revealed without the written permission of the people tested, except as required by state law. (States that report HIV-positive test results to the public health department are required by law to keep the information confidential.)

If people decide to be tested anonymously—

- Neither their names nor any identifying information that could link their test results to them is recorded.
- Only the people who are tested can find out their test results. (Some states offer free anonymous testing to discourage blood donation for the purpose of getting a free HIV test.)

Whichever method of testing is used, people need to get counseling both before and after being tested. Deciding to be tested is not always easy. Many people fear the reactions of family, friends, employers, and others if test results are positive. However, if people have HIV, getting treatment before the immune system is damaged is important. In many ways, HIV infection has become a treatable condition. Doctors can monitor the health of people with HIV and provide them with a range of treatments to suppress the virus itself and to prevent, delay, or treat opportunistic infections. (As for any medical condition, people who want treatment for HIV infection need to give their names and other information to their doctors.) Although there is no cure for HIV infection, available treatments can extend life and improve the quality of life for people with HIV. Now more than ever, there are health benefits in knowing one's HIV status.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

Centers for Disease Control and Prevention. "Availability of Anonymous and Confidential HIV Counseling and Testing in Publicly Funded Test Sites, United States and Puerto Rico." May 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

How long should I wait before being tested? What is the "window period"?

DETAILED: If people who have HIV (the virus that causes AIDS) know they are infected, they can take early steps to protect their health. Before getting tested, people should wait three months from the time they think they may have been infected with HIV and avoid taking risks related to HIV during the period before they are tested. Most people develop detectable levels of antibodies to HIV within three months of becoming infected. The average time to develop detectable antibodies is 25 days.

The period between infection and the point when tests can detect antibodies is called a "window period." This means that if people get tested during this period, their test results may be negative even though they have HIV. If people test negative but continue to take risks related to HIV (having sex or sharing needles and syringes with people who have HIV or who are unsure of their HIV status), they need to get retested every three to six months.

If people test negative, take no risks related to HIV, and then test negative again six months later, they probably do not have HIV. Stopping or reducing behavior related to HIV transmission can help people protect themselves and others from HIV infection.

BASIC: Before getting tested, it is useful for people to wait three months from the time they think they may have been infected with HIV (the virus that causes AIDS). This is enough time for most people to develop antibodies to HIV. (The average time is 25 days.) Otherwise, people may test negative even though they have HIV. This is called the "window period." People need to avoid taking risks related to HIV during the period before they are tested.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. 22. "Update: Provisional Public Health Service Recommendations for Chemoprophylaxis After Occupational Exposure to HIV."
Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 2S.

What tests are most commonly used to tell if someone is infected with HIV?

Basic: The EIA is the standard screening test used to detect HIV. If HIV antibodies are detected by an EIA, the test is repeated. If the second EIA shows antibodies, a test (either Western blot or IFA) is run to confirm the presence of antibodies to HIV. This procedure makes a positive test result nearly 100 percent accurate.

Detailed: A number of tests are available to tell if someone is infected with HIV. These tests are some of the most accurate medical tests known. The EIA, which stands for enzyme immunoassay (formerly called ELISA), is the standard screening test used to detect HIV. The EIA looks for antibodies to HIV in a sample of blood or fluid from the mouth. If the test detects HIV antibodies, the EIA is repeated. If the second test reacts to antibodies, the sample is tested using a different test to confirm the two EIA (screening test) results. The Western blot and IFA (indirect immunofluorescence assay) are the confirmatory tests most commonly used today. Following this procedure makes a positive test result nearly 100 percent accurate.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What does it mean if I test positive?

Basic: A positive EIA (enzyme immunoassay) result means that a person has antibodies to HIV (the virus that causes AIDS). Having HIV antibodies indicates that a person has HIV and can infect others through sexual and blood-to-blood contact. A woman who has the virus may infect her baby before or during birth or through breast feeding.

Detailed: A positive, or antibody-positive, EIA (enzyme immunoassay) result means that a person has antibodies to HIV (the virus that causes AIDS). Before a person is considered antibody-positive, health care workers complete the following steps:

- Use the EIA to test a sample of blood or fluid from the mouth to look for HIV antibodies.
- Repeat the EIA if the first test shows a reaction to HIV antibodies.
- Run a confirmatory test, usually the Western blot or IFA (indirect immunofluorescence assay), if two or more EIAs react to HIV antibodies.

The Western blot, IFA, and EIA are antibody tests; they do not look for HIV itself but instead detect HIV antibodies, substances the body produces to help defend itself against HIV. Because the Western blot and IFA are more specific, they are used to confirm EIA results.

Scientists know that all* antibody-positive people—

- Are infected with HIV.
- Will always be infected.
- Can infect others through sexual and blood-to-blood contact. A woman who has the virus may infect her baby before or during birth or through breast feeding.

This is true even for people with HIV who benefit from combination therapy.

* This excludes babies born to infected women. Many of these babies may have their mother's HIV antibodies in their blood but may not be infected themselves.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Can I test positive and still look and feel healthy?

Detailed: Yes, people can have HIV (the virus that causes AIDS) and still look and feel healthy. About half the people who become infected with HIV develop symptoms of HIV infection within 10 years. After 12 years, 65 percent develop AIDS. More recently, powerful new combination therapy, including protease inhibitors, has been shown to slow the pace of HIV infection, extending life and improving the quality of life for many people with HIV.

HIV can be active inside the body for years before it starts to create symptoms. HIV is in the white cells of the blood and lymph system and in certain body fluids. Even if they feel healthy, people with HIV can infect other people if they have blood-to-blood contact through sharing needles and syringes or have sexual contact without using a latex condom. This is true even for people with HIV who benefit from combination therapy.

If people have HIV, they can benefit from seeing a doctor as soon as possible. More and better treatments now available can help people with HIV protect their health.

Basic: Yes, people can have HIV (the virus that causes AIDS) and still look and feel healthy. About half the people who become infected with HIV develop symptoms of AIDS within 10 years. After 12 years, 65 percent develop AIDS. More recently, powerful new combination therapy, including protease inhibitors, has been shown to slow the pace of HIV infection, extending life and improving the quality of life for many people with HIV. Even if they feel healthy, people who have HIV can spread the virus to others through sharing needles and syringes or having sex without a latex condom.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What does a negative test result mean?

BASIC: A negative EIA (enzyme immunoassay) result means that a person shows no sign of having antibodies to HIV (the virus that causes AIDS). However, a person with HIV might test negative if he or she is tested before having produced a detectable level of antibodies.

DETAILED: A negative EIA (enzyme immunoassay) result means that a person shows no sign of having antibodies to HIV (the virus that causes AIDS). A negative result can mean one of two things:

1. The person does not show signs of HIV antibodies and does not have the virus.
2. The person was recently infected and has the virus, but the test was not yet able to detect antibodies.

The EIA detects antibodies to HIV, not the virus itself. The body does not make antibodies right after being infected with HIV, but most people develop antibodies to HIV within three months after becoming infected. The average time is 25 days. If someone with HIV is tested before developing enough antibodies for the test to detect, he or she might test negative, even though the virus is present. Someone who tests negative but wants to be sure of the test result needs to—

- Wait an adequate time after the last negative test result to be retested. Most people develop antibodies within three months after becoming infected. The average time is 25 days. But early diagnosis and treatment are also important.
- Avoid taking any HIV-related risks (having sex or sharing needles and syringes) before being retested.

Some people who test negative mistakenly believe that they are immune to HIV. To keep from getting infected, a person who tests negative needs to avoid having sex without a latex condom or sharing needles and syringes with anyone who has HIV. It is hard to know for sure whether or not another person has HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. 22. "Update: Provisional Public Health Service Recommendations for Chemoprophylaxis After Occupational Exposure to HIV."
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Blood Supply and Related Issues

Can I get AIDS by giving blood?

Detailed: No. AIDS is a result of infection caused by a virus (HIV). People cannot get this virus or any other germ by giving blood in the United States because—

- Every piece of equipment (needles, tubing, and containers) used to draw blood is sterile.
- No piece of equipment has been used on anyone except the person donating blood.
- All needles are discarded properly after blood is drawn.

People cannot get HIV by giving blood. It is important for people who are eligible to give blood to do so periodically. Lives depend on it.

Basic: No. AIDS is a result of infection caused by a virus (HIV). People cannot get HIV by giving blood. In the United States, all equipment used to take blood is new and sterile. Needles are discarded after blood is drawn.

Sources: American Red Cross. *What You Must Know Before Giving Blood.* February 1997.
American Red Cross. "Giving and Receiving Blood." Fact sheet. June 1996.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Is the blood supply safe?

BASIC: The risk of becoming infected with HIV (the virus that causes AIDS) from a blood transfusion in the United States is extremely low. To protect people who receive blood transfusions from becoming infected with HIV, the Red Cross and other blood banks have interviewed donors since 1983 and tested blood for signs of HIV since 1985.

DETAILED: The risk of becoming infected with HIV (the virus that causes AIDS) from a blood transfusion is extremely low. Since donor interviews for HIV risks began in 1983 and HIV-antibody testing began in 1985, the risk of HIV-contaminated blood entering the blood supply has dropped dramatically. In 1992, antibody testing was expanded to include HIV-2 (in addition to HIV-1). In 1996, testing for the p24 antigen was added as an interim measure to improve the overall sensitivity of testing procedures for HIV, until other tests become available that further shorten the "window period." The Food and Drug Administration (FDA) has indicated that the development and implementation of genome amplification technology (PCR and TMA are examples) is warranted, to further protect the blood supply. The chance of receiving an HIV-infected transfusion in the United States is estimated to be 1 in 676,000.

The main reason for this risk is that some recently infected people, who do not know they are infected, may give blood. Blood tests now in use look for antibodies to both HIV-1 and HIV-2, and for p24, a viral antigen. Together, these tests detect almost all HIV in blood, although the tests may not be able to detect signs of HIV in the blood of some recently infected people. However, people with HIV and those at risk for HIV infection rarely donate, and HIV-infected donations rarely slip through because of thorough donor interviewing and blood testing. Scientists are working to improve existing procedures and create new testing procedures that will make the blood supply even safer.

Sources: American Red Cross Biomedical Services. *Manufacts,* Winter 1998. "Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples." Stramer, S.L.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Transfusion, 1997; vol. 37. "Cost-Effectiveness of Expanded Human Immunodeficiency Virus Testing Protocols for Donated Blood." AuBuchon, J., et al.

Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. RR-2. "U.S. Public Health Service Guidelines for Testing and Counseling Blood and Plasma Donors for Human Immunodeficiency Virus Type 1 Antigen."

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How does the Red Cross protect the blood supply?

DETAILED: The Red Cross and other blood banks use a combination of measures to protect the blood supply from becoming infected with HIV (the virus that causes AIDS) and other germs:

- **Donor education.** Potential donors receive a pamphlet that outlines risk behavior related to HIV and medical histories that preclude blood donation. For example, people are asked not to give blood if they are men who have sex with men, if they share needles and syringes, if they have hemophilia and take clotting factors, or if they exchange sex for money or drugs (or are clients of people who do so).
- **Donor interviewing.** Staff interview prospective donors about any behavior or medical histories that indicate HIV risk. Anyone who admits to high-risk activities may not give blood.
- **Confidential unit exclusion** (CUE). Before giving blood, donors place one of two stickers on their donor registration cards. One sticker means that the blood should be used, the other that it should not. Because stickers are computer-coded, no one looking at the stickers can tell which is which. Donors who think they may be at risk of HIV infection, therefore, can stop their blood from being used for a transfusion, without embarrassment. Also, donors receive a telephone number and an ID number for their donated blood. If within a few days they decide their blood should not be used, donors can call the blood bank and give the ID number. Their blood will then be destroyed.
- **Testing for signs of HIV.** Blood banks test a sample of every blood donation for antibodies to HIV-1 and HIV-2 and for p24 antigen. Any blood that shows the presence of the virus is destroyed. In addition, the Food and Drug Administration (FDA) has indicated that the development and implementation of genome amplification technology is warranted, to further protect the blood supply. Examples of this technology are PCR and TMA.

Blood collection centers (blood banks) also maintain confidential donor deferral registries, which contain identifying information about donors who, for medical reasons, are disqualified from giving blood. Blood may be unsuitable for donation because of a donor's positive test results for transmissible diseases, answers to health history questions, or connection to post-transfusion infection.

Given these measures, the risk of HIV-infected blood entering the blood supply in the United States is extremely low.

BASIC: The Red Cross and other blood banks do several things to protect the blood supply from HIV (the virus that causes AIDS). In particular, blood banks educate donors about who should not give blood. Blood banks also interview everyone who wants to give blood, giving donors at least two chances to stop, without embarrassment, their donations from being used. Blood banks test all donors' blood each time they donate.

Sources: American Red Cross Biomedical Services. *Manufacts,* Winter 1998. "Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples." Stramer, S.L.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

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Transfusion, 1992; vol. 32, no. 9. "Blood Donor Deferral Registries: Highlights of a Conference." Grossman, B., and Springer, K.

American Association of Blood Banks, American Red Cross, and Council of Community Blood Centers. *Circular of Information for the Use of Human Blood and Blood Components.* March 1989.

American Red Cross. *Blood Services Directive 5.29.* 1989.

When did blood banks start testing blood for HIV?

BASIC: In the spring of 1985.

DETAILED: In the spring of 1985, as soon as the Food and Drug Administration (FDA) licensed the ELISA (an antibody test), the Red Cross and other blood banks began testing all donated blood for HIV antibodies. Since then, testing methods have greatly improved.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 7 (suppl.). "HIV Transmission Through Blood, Tissues, and Organs." Peterson, L., et al.
Food and Drug Administration. "Testing for Antibodies to HTLV-III." Memorandum. May 1985.

When did blood banks begin interviewing donors about their risk of having AIDS?

BASIC: In 1983, the Red Cross and other blood banks officially began to interview donors to determine their risk of having HIV, the virus that causes AIDS.

DETAILED: In 1983, two years before any blood test that detects signs of HIV was available, the Red Cross and other blood banks officially began to interview donors to check their risk of having HIV, the virus that causes AIDS. At that time, people wanting to give blood received written information about how HIV-related risk behavior defers someone from giving blood. People were then interviewed to detect symptoms of AIDS or any behavior that put them at risk.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. RR-2. "U.S. Public Health Service Guidelines for Testing and Counseling Blood and Plasma Donors for Human Immunodeficiency Virus Type 1 Antigen."
AIDS, 1994; vol. 7 (suppl.). "HIV Transmission Through Blood, Tissues, and Organs." Peterson, L., et al.
American Medical Association. *Information on AIDS for the Practicing Physician.* July 1987.
Food and Drug Administration. *Recommendations to Decrease the Risk of Transmitting Acquired Immune Deficiency Syndrome (AIDS) from Plasma Donors.* March 1983.

How good are the tests used to test for HIV?

DETAILED: All donated blood is screened using an HIV-antibody test known as the EIA. This test is very good. Studies show that the test, used with a confirmatory test, detects antibodies to HIV in more than 99.8 percent of all HIV-infected blood. The Western blot is most commonly used to confirm repeatedly reactive EIAs. The p24 antigen test (added as an interim measure in 1996) improves the overall sensitivity of testing procedures for HIV. In addition, the Food and Drug Administration (FDA) has indicated that the development and implementation of genome amplification technology (such as PCR and TMA) is warranted, to further protect the blood supply.

By interviewing donors to assess their risk of having HIV and by using such sensitive tests, the Red Cross and other blood banks protect the blood supply from almost all HIV-infected blood. Because all donors are interviewed and all donations are screened for HIV antibodies, the risk of HIV-infected blood entering the blood supply is extremely low.

BASIC: The tests used to protect the blood supply from HIV, the virus that causes AIDS, are very good. The antibody tests find more than 99.8 percent of all HIV-infected blood. The p24 antigen test (added as an interim measure in 1996) expands this protection. Efforts to improve testing to protect the blood supply continue.

Sources: American Red Cross Biomedical Services. *Manufacts,* Winter 1998. "Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples." Stramer, S.L.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. RR-2. "U.S. Public Health Service Guidelines for Testing and Counseling Blood and Plasma Donors for Human Immunodeficiency Virus Type 1 Antigen."
AIDS, 1994; vol. 7 (suppl.). "HIV Transmission Through Blood, Tissues, and Organs." Peterson, L., et al.

If I am having elective surgery, can I store my own blood?

DETAILED: Yes. Giving blood for one's own use later is known as *autologous donation.* People who are soon having surgery that may require a blood transfusion may decide to store their own blood. As is true of other blood banks, Red Cross offers autologous donation services to help people by storing blood for scheduled (nonemergency) surgery and sending the blood to the hospital in time for surgery.

BASIC: Yes. People may decide to store their own blood (autologous donation) before having scheduled (nonemergency) surgery for which they may need a blood transfusion. The Red Cross or other blood banks can help with storage.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Red Cross. "Giving and Receiving Blood." Fact sheet. June 1996.
American Red Cross. *Blood Services Directive 4.37.* 1988.

Can I have my family members and friends give blood for me to use during surgery?

BASIC: Yes. Like any other donated blood, blood donated by friends and family is tested for signs of HIV, the virus that causes AIDS, and some other germs. Donations from the general public, however, are not thought to be any riskier than designated donations.

DETAILED: Blood given for a friend or family member is called a *designated donation.* The Red Cross encourages its blood centers to offer designated donations if communities request them. Donations from the general public, however, are not thought to be any riskier than designated donations. The risk of receiving an HIV-infected transfusion in the United States is extremely low. It is estimated to be 1 in 676,000.

No one should be pressured to donate blood.

Sources: *Transfusion,* 1997; vol. 37. "Cost-Effectiveness of Expanded Human Immunodeficiency Virus Testing Protocols for Donated Blood." AuBuchon, J., et al.

New England Journal of Medicine, 1995; vol. 333, no. 26. "Estimated Risk of Transmission of the Human Immunodeficiency Virus by Screened Blood in the United States." Lackritz, E.M., et al.

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Transfusion, 1992; vol. 32 (suppl.). "The Prevalence of Infectious Disease Markers in Directed vs. Homologous Blood Donations." Williams, A., et al.

How are people with hemophilia protected from getting AIDS?

Detailed: All blood used to make clotting factors for people with hemophilia is tested for signs of HIV (the virus that causes AIDS). Tests include the following:

- The EIA (enzyme immunoassay, formerly called the ELISA), which is the standard screening test. This test is very good. Studies show that the test, used with a confirmatory test, detects antibodies to HIV in more than 99.8 percent of all HIV-infected blood.
- The Western blot or immunofluorescence assay (IFA) is used to confirm repeatedly reactive EIAs.
- The p24 antigen capture assay was added by the Food and Drug Administration (FDA) in 1996 to improve the overall sensitivity of testing procedures for HIV. The FDA took this interim measure until other tests become available to further shorten the "window period." Few infected donations have been found using this test.
- Future tests may include genome amplification technology. Examples are PCR and TMA. The Food and Drug Administration (FDA) has indicated that the development and implementation of this technology is warranted, to further protect the blood supply.

Infected blood that is found is destroyed.

After being tested, blood used for clotting factors undergoes heat and chemical treatments that inactivate any HIV (and certain other germs) the tests may not have detected. (The dry-heat method is no longer used.)

There are two common types of clotting factors produced: Factor VIII and Factor IX. Factor VIII is used by people with hemophilia A. Factor IX is used by people with hemophilia B. These clotting factors are prepared from the blood of many donors.

Before 1985, when testing for signs of HIV first became available, many people with hemophilia became infected with HIV when they unknowingly used infected clotting factors. Since 1985, however, every blood donation has been tested for signs of HIV (and certain other bloodborne germs).

Since 1984, blood processing centers have used methods that inactivate HIV and other germs. Over time, these methods have improved, and centers now use more vigorous forms of treatment (including solvent and detergent and monoclonal antibody purification) during the production of Factor VIII and Factor IX. These treatments destroy HIV and other germs. Research from the long-term Seroconversion Surveillance Project indicates that the risk of HIV infection from clotting factors now available is extremely low. To date, no one has become HIV-infected from using them. Also, some clotting factors are produced using recombinant technology.

Thanks to the treatment innovations described above, people with hemophilia now have little risk of receiving HIV-contaminated clotting factors. The cost of purifying clotting factors is high; however, experts hope that better production processes will help lower these costs.

Basic: All blood used to make clotting factors for people with hemophilia is tested for signs of HIV (the virus that causes AIDS). Infected blood that is found is destroyed. Blood to be used for clotting factors undergoes procedures to inactivate any HIV (and certain other germs) the tests may not have detected.

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Sources: American Red Cross Biomedical Services. *Manufacts,* Winter 1998. "Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples." Stramer, S.L.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. RR-2. "U.S. Public Health Service Guidelines for Testing and Counseling Blood and Plasma Donors for Human Immunodeficiency Virus Type 1 Antigen."

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Journal of the American Medical Association, 1989; vol. 261, no. 23. "The Use of Purified Clotting Factor Concentrates in Hemophilia: Influence of Viral Safety, Cost, and Supply on Therapy." Pierce, G., et al.

Hemophilia Information Exchange. Medical Bulletin 145. Chapter Advisory 148.

Why are some people with hemophilia still getting AIDS?

DETAILED: There are approximately 20,000 people with hemophilia in the United States. Almost all people with hemophilia who now are developing AIDS became infected with HIV (the virus that causes AIDS) before 1985, when blood testing began. Studies show that about 70 percent of people with severe hemophilia A and about 35 percent of people with hemophilia B or mild hemophilia A are HIV-infected. As of December 1997, 4,922 people with hemophilia/coagulation disorder had been diagnosed with AIDS.

Although they have had the virus for many years, many people with hemophilia have yet to develop AIDS because of the long and variable incubation period. Some research shows that people who were younger than 35 when they became infected may take more than 15 years to develop AIDS. Also, powerful new combination therapy, including protease inhibitors, has been shown to slow the pace of infection in many people with HIV. These treatments extend life and improve the quality of life for many people with HIV.

Tests to detect HIV-infected blood were not available until 1985. Now, all blood used for clotting factors is first tested for signs of HIV. Tests include the following:

- The EIA (enzyme immunoassay, formerly called the ELISA), which is the standard screening test. This test is very good. Studies show that the test, used with a confirmatory test, detects antibodies to HIV in more than 99.8 percent of all HIV-infected blood.
- The Western blot or the immunofluorescence assay (IFA) is used to confirm repeatedly reactive EIAs.
- The p24 antigen capture assay was added by the Food and Drug Administration (FDA) in 1996 to improve the overall sensitivity of testing procedures for HIV. The FDA took this interim measure until other tests become available to further shorten the "window period." Few infected blood donations have been found with this test.
- Future tests may include genome amplification technology. Examples are PCR and TMA. The Food and Drug Administration (FDA) has indicated that the development and implementation of this technology is warranted, to further protect the blood supply.

Blood that tests positive for HIV is destroyed. Also, all clotting factors undergo heat and chemical (solvent and detergent) treatments or monoclonal antibody purification to destroy any HIV and most other germs that may not have been detected by testing. (The dry-heat method is no longer used.) As a result, AIDS cases among people with hemophilia from HIV-infected blood will probably drop to nearly zero in the future. Like other people, however, people with hemophilia may become infected with HIV through having sex or sharing needles with a person who has HIV.

BASIC: Almost all people with hemophilia who are now developing AIDS became infected with HIV (the virus that causes AIDS) before 1985. Tests to detect signs of HIV were not yet available, and clotting factors were not yet being treated to destroy germs in the blood. Like other people, people with hemophilia may become infected with HIV by having sex or sharing needles and syringes with a person who has HIV.

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Sources: American Red Cross Biomedical Services. *Manufacts,* Winter 1998. “Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples.” Stramer, S.L.

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Journal of the American Medical Association, 1989; vol. 261, no. 23. “The Use of Purified Clotting Factor Concentrates in Hemophilia: Influence of Viral Safety, Cost, and Supply on Therapy.” Pierce, G., et al.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Children and HIV

How do babies and young children get AIDS?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Infants and children become infected with HIV in the following ways:

- If their mothers have HIV, during pregnancy or birth or through breast feeding. (Most babies and children with HIV become infected in this way.)
- By receiving infected blood products or transfusions. (This now happens very rarely, because all blood and blood products have been tested for signs of HIV since 1985.)
- Through sexual contact, including sexual abuse, by someone who has HIV. (This is a less common mode of transmission.)

As of December 1997, 91 percent of infants and children under 13 with AIDS were born to mothers who had HIV. Many of the women did not know their HIV status until their children were diagnosed. The women had become pregnant, not knowing they were infected, and could spread the virus to their babies. However, between 1992 and 1996, the number of children born with HIV who developed AIDS decreased by almost half. This decrease is due to greater success in preventing the spread of HIV from women with HIV to their babies.

In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several details about the use of AZT during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

By December 1997, 5 percent of children with AIDS had become infected through receiving infected blood, blood components, or tissue, and 3 percent had hemophilia or coagulation disorder. Almost all had become infected before tests for HIV were developed and approved. Since 1985, all blood used for transfusions and blood components has been tested for signs of many diseases, including HIV infection. Blood products for people with hemophilia are treated to kill HIV and certain other germs. As a result, it is now unlikely for anyone to get HIV through blood components or transfusions.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Babies and children under 13 years of age get this virus in the following ways:

- If their mothers have HIV, before or during birth or through breast feeding. (Most babies and children with HIV become infected in this way.)
- Through blood products or transfusions that contain the virus. (This now happens very rarely, because all blood and blood products have been tested for signs of HIV since 1985.)
- Through sexual contact by someone who has HIV. (This is a less common mode of transmission.)

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Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

If a mother has HIV, will her baby automatically become infected?

BASIC: No. Experts estimate that 25 percent of babies born to mothers with HIV become infected. Treatment with AZT (zidovudine) given to both mother and baby has been shown to reduce the rate to about 8 percent.

DETAILED: No. Experts estimate that 25 percent of babies born to mothers with HIV become infected. Scientists are studying why some babies become infected and some do not.

Between 1992 and 1996, the number of children born with HIV who developed AIDS decreased by almost half. This decrease is due to greater success in preventing the spread of HIV from women with HIV to their babies.

In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several details about the use of AZT during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."
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National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

If the father has HIV but the mother does not, can the baby become infected?

DETAILED: Scientists are not sure. Although HIV is found in semen, whether sperm cells* alone can acquire HIV or cause infection is not known. Sperm cells are carried in semen, but no studies have clearly found sperm cells alone to be infectious. For the father to directly infect the baby at conception without also infecting the mother, sperm cells would have to be infected or carry HIV.

Scientists do know, however, that the virus can be transmitted to the baby if a father with HIV infects the mother before or during pregnancy or while she is breast feeding.

BASIC: Scientists are not sure.

* Sperm cells from a male fertilize the egg from a female to create a baby.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention.* 4th ed. 1997.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital.* 2nd ed. 1994.

If a baby tests positive, does it mean that he or she has HIV? How soon can a baby be tested for HIV?

BASIC: Doctors may test for antibodies to HIV (the virus that causes AIDS) soon after a baby is born. However, because babies normally receive antibodies from their mothers (including HIV antibodies, if the mother has HIV), most doctors wait until a baby is at least 15 months old before trusting positive HIV-antibody test results. By that time, antibodies the baby received from his or her mother will be gone. If a baby still tests positive for HIV antibodies after 15 months, the baby probably is infected and has developed his or her own HIV antibodies.

DETAILED: The standard test now in use cannot reliably detect HIV infection in infants younger than 15 months of age. Before birth, babies normally receive a variety of antibodies from their mothers. These antibodies help protect the babies from diseases after birth, until their own immune systems have developed. If a mother has HIV and has developed HIV antibodies, one of the following three things could happen to the baby during pregnancy:

1. The baby could receive both HIV and HIV antibodies.
2. The baby could receive HIV antibodies but not the virus itself.
3. The baby could receive neither HIV nor HIV antibodies.

Babies who receive the virus from their mothers will develop their own HIV antibodies. The HIV-antibody tests now used, however, do not distinguish between antibodies from the mother and those the baby develops. Because the mother's antibodies (including HIV antibodies) may stay in the baby's blood for up to 15 months, the baby's first positive HIV-antibody tests may be inaccurate. Doctors will not know immediately whether a baby who tests positive received antibodies alone or both antibodies and HIV. If a baby continues to test positive for HIV after 15 months of age, doctors know that the baby probably received both HIV and HIV antibodies and is infected.

Other tests, such as the polymerase chain reaction (PCR) test, and viral culture techniques are highly accurate, but expensive and complicated. These tests have been used to diagnose HIV infection in infants three to six months of age. The p24 antigen test (used to detect an antigen, or viral protein) has been used with infants and holds promise as an inexpensive, reliable method for diagnosing HIV infection in babies as young as one week old. Another test, called the IgA antibody test, is in experimental use in research settings.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American People on HIV Infection and AIDS.* June 1993.

My child has HIV. What precautions should I take?

DETAILED: People cannot become infected with HIV (the virus that causes AIDS) through everyday casual contact with a child who has the virus. It is safe to maintain casual contact—such as through hugs and kisses—with a child who has HIV. People can share food, utensils, dishes, bathrooms, and bedrooms with a child who has HIV without risk.

People should avoid contact with the blood of a child who has HIV because blood can spread the virus. There is no risk of getting the virus from vomit, feces, or urine, unless these fluids contain visible blood. However, other germs can be spread through urine and feces. People should avoid touching urine or feces and wash their hands well after changing diapers.

People should wear rubber or latex housekeeping gloves to clean up blood spills or blood from cuts. Using a fresh solution of one-fourth of a cup of chlorine bleach to one gallon of water is a cost-effective way to clean up contaminated areas. People should wash their hands after cleaning up bloody areas. For more information on infection-control procedures, people can contact their doctors or public health departments.

BASIC: People cannot become infected with HIV (the virus that causes AIDS) through everyday casual contact with a child who has the virus. It is safe to maintain casual contact—such as through hugs and kisses—with a child who has HIV. People need to take care, however, to avoid contact with the child's blood because it may carry HIV. For general health reasons, people should not touch urine or feces, and they should wash their hands well after changing diapers.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *Questions and Answers—HIV Transmission in Household Settings.* December 4, 1993.

Centers for Disease Control and Prevention. *National AIDS Hotline Training Bulletin,* March 30, 1993; no. 38.

Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

Can children with AIDS spread it to other children?
Can my child get AIDS from a babysitter or child care worker?
Can a child with HIV spread it to a brother or sister?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV), which is hard to get. A child will not become infected from casual everyday contact with HIV-infected children, school personnel, or child care workers.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV), which is hard to get. A child will not become infected from casual everyday contact with HIV-infected children (including brothers and sisters), school personnel, or child care workers. From many studies involving family members and friends of people with HIV, scientists know that anyone can share pens, paper, utensils, drinking glasses, sleeping areas, school rooms, and swimming pools with a person who has HIV and not become infected.

There have been several cases in which people had apparently become infected with HIV from others in their households. The Centers for Disease Control and Prevention (CDC) investigated these cases and concluded that all the people who became infected had been exposed to HIV through blood, sexual activity, or perinatal transmission.

The CDC recommends that caregivers at home follow infection control guidelines to avoid exposure to blood and other body fluids of a person with HIV. Like the universal precautions for health care workers, these guidelines help protect caregivers at home from HIV infection. People can contact their doctors or public health departments for more information about infection control guidelines.

Sources: *Clinical Pediatrics,* 1998; vol. 37, pp. 175–178. "Lack of Evidence of Transmission of HIV-1 to Family Contacts of HIV-1 Infected Children." Courville, T.M., et al.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 43, no. 19.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Pediatrics, 1990; vol. 85, no. 2. "Lack of Transmission of Human Immunodeficiency Virus From Infected Children to Their Household Contacts." Rogers, M., et al.

Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

What if my child is bitten by a child with AIDS?

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). It is highly unlikely for a child to become infected with HIV if bitten by a child who has HIV. Although there is a theoretical possibility that HIV could be spread through saliva, it is highly unlikely. In addition, saliva contains proteins that have destroyed HIV in laboratory studies.

For someone to become infected with HIV through a human bite—

- The person with HIV would have to have blood in his or her mouth.
- The person with HIV would have to bite another person hard enough to break the skin. (This rarely happens in bites by children.)
- The person with HIV would have to bleed into the other person's wound.

There have been a few cases in which biting that involved blood-to-blood contact has caused HIV infection. From an investigation of a human biting incident, a state health department reported that the evidence suggested that HIV was transmitted through blood-to-blood contact. Other reports in the medical literature have noted that a human bite appeared to have transmitted HIV. These reports describe the presence of blood and severe injury with extensive torn and damaged tissue.

There have also been many cases in which bites by people with HIV have not caused infection. Scientists have studied health care workers bitten by patients with HIV and children bitten by playmates with HIV. There is no evidence that any of the health care workers or the children have become infected with HIV from these bites.

There have been no reported cases of HIV infection through a human bite unless there is blood-to-blood contact. A child is at little risk of getting the virus if bitten by someone who has HIV.

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). A child is highly unlikely to become infected from a bite of a child who has HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. "Blood-to-Blood Transmission of HIV Via Bite." Presented at the 11th International Conference on AIDS, Vancouver, British Columbia, July 7–12, 1996. Liberti, T., et al.

Lancet, 1996; vol. 347. "Transmission of HIV-1 by Human Bite." Vidmar, L., et al.

National Association of State Boards of Education. *Someone at School Has AIDS: The Complete Guide to Education Policies Concerning HIV Infection.* 1996.

Journal of Acquired Immune Deficiency Syndromes, 1993; vol. 6, no. 4. "The Potential for Transmission of Human Immunodeficiency Virus Through Human Bites." Richman, K.M., and Rickman, L.S.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

What if a child with AIDS throws up on my child?
What if my child gets near the vomit, urine, or feces of a child with AIDS?

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). A child has no risk of getting the virus from the vomit, feces, or urine of a child who has HIV, unless these fluids contain visible blood. Even then, the risk is low.

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). A child has little or no risk of getting HIV from the vomit, feces, or urine of a child who has HIV. For a child to become infected with HIV, all of the following must occur:

- The vomit, urine, or feces of a child with HIV must contain visible blood. Without blood, none of these body fluids contain enough of the virus to be infectious.
- Another child must have direct contact with the blood-specked vomit, diarrhea, or urine of the child with HIV.
- The body fluid that contains blood from the child with HIV must reach the other child's open cuts, sores, or mucous membranes. Otherwise, the virus cannot enter the child's body to cause infection.

It is highly unlikely that all three of these events would occur. Nonetheless, for general health reasons, the Public Health Service (PHS) has developed guidelines for school personnel to follow when a child vomits or loses control of body fluids. Caregivers can teach children to avoid contact with the body fluids of other children.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Association of State Boards of Education. *Someone at School Has AIDS: The Complete Guide to Education Policies Concerning HIV Infection.* 1996.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 43, no. 19.
Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

Can my child get AIDS through a school yard fight or during contact sports?

DETAILED	BASIC
AIDS (a result of HIV infection) is caused by a virus (HIV). It is highly unlikely that a child could become infected with HIV through fighting or playing sports with an infected child. For a child to become infected with HIV— • Another child involved in the fighting or playing would have to have HIV. • The child with HIV would have to bleed. • The child without HIV would have to have direct contact with the infected child's blood. • The infected blood would have to reach either an open cut or sore on the skin or a mucous membrane in the nose, mouth, or throat of child who does not have HIV. Otherwise, the virus cannot enter the body to cause infection. It is highly unlikely that all of these conditions would occur at the same time. In one unusual case in 1997, two men got in a physical fight that included "head-butting." One man, who had HIV, broke the skin on the other man's forehead during the fight. The blood of the man with HIV entered the other man's body through the cut, causing infection. The case—the only one reported of its kind—is consistent with the conditions listed above. All of these conditions would need to be present for someone to become infected with HIV through fighting or playing sports with someone who has HIV. There is little risk of a child getting HIV through fighting or playing sports. If bleeding occurs during a fight or sports activity, everyone should avoid contact with the injured person's blood. Remove the person from the activity until the bleeding is controlled. Sweat from an HIV-infected athlete does not transmit HIV.	AIDS (a result of HIV infection) is caused by a virus (HIV). A child cannot get the virus from playing sports or fighting with an HIV-infected child unless that child bleeds. Even then, the risk is very low.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Lancet, 1997; vol. 350, no. 9088. "Transmission of HIV-1 and HCV by Head-Butting." Brambilla, A., et al.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
Journal of Infectious Diseases, 1992; vol. 165. "Absence of Infectious Human Immunodeficiency Virus Type 1 in 'Natural' Eccrine Sweat." Wormser, G., et al.
Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes for Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.

Is there a way to protect children from getting AIDS?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). People can protect children by teaching them how HIV is spread and how it is not spread. If children know how to keep from becoming infected, they will know how to protect themselves and others in the future.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Unless their mothers had HIV before they were born or while they were breast feeding, children have little risk of getting the virus. Also, AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth can greatly reduce the rate of HIV transmission from a mother with HIV to her baby. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

Children's best protection against HIV (the virus that causes AIDS) is knowing how HIV spreads and having the skills to prevent infection. In age-appropriate ways, people can teach children how the virus spreads from person to person through sexual and blood-to-blood contact and how they can keep from becoming infected. That way, children will know how to protect themselves and others in the future.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Centers for Disease Control and Prevention. *MMWR,* 1988; vol. 37, no. S-2.

What can women who may have AIDS do if they are thinking about becoming pregnant?

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). Some experts suggest that health care workers offer testing to women who wish to have children, to help them weigh the risks of pregnancy before becoming pregnant, if they do have HIV. The standard test is an EIA, an antibody test. Because there are treatments that greatly reduce the rate of HIV transmission from mothers with HIV to their babies, the Centers for Disease Control and Prevention (CDC) has recommended routine HIV counseling and voluntary testing for all pregnant women.

If women test negative for signs of HIV, it may mean that they do not have HIV. However, if they have taken risks related to HIV (sharing needles and syringes or having sex with a person who has HIV) within six months before testing, they need to be retested, after waiting an adequate time for detectable antibodies to develop (if they are infected). Usually, this happens within three months after becoming infected; the average time is 25 days. If they do not take risks related to HIV and are negative for HIV antibodies after six months, they probably do not have HIV. Women who test negative can stay free of the virus by avoiding risky behavior. If women do not have HIV, there is no risk of spreading the virus to a baby.

Pregnant women who test positive for HIV antibodies need to see a doctor as soon as possible and have regular prenatal checkups. They can also get treatments that greatly reduce the risk of HIV transmission from mother to baby. In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth greatly reduced the rate of HIV transmission from mothers to their babies. Great advances since then have led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors.

A pregnant woman with HIV may wish to discuss reproductive options with a health care professional. Researchers are studying the effects of pregnancy on women with HIV. Because women with HIV have health concerns apart from pregnancy, they may also wish to explore their options for ongoing medical care, treatment, and support and social services.

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). Women who think they may have the virus and are considering pregnancy may wish to be tested for signs of HIV. The standard test is an EIA, an antibody test. Before getting pregnant, any woman who has HIV may want to talk to a doctor about the impact of pregnancy and HIV infection on herself and the baby.

Sources:
Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-4. "Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection."
Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."
Centers for Disease Control and Prevention. "Perinatal HIV Prevention Update: Evidence of Progress and Challenges for the Future." November 1997.
Cotton, D., and Watts, D.H, eds. *The Medical Management of AIDS in Women.* 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."
National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

Social Impact

Are there laws protecting people with AIDS from discrimination?

BASIC: Yes. The Americans With Disabilities Act (ADA) of 1990 protects people with disabilities (including HIV infection) from discrimination in the workplace and in public accommodations solely on the basis of their disabilities. Other laws give some protection from discrimination in certain areas. However, no laws completely protect HIV-infected people and their families from discrimination.

DETAILED: Yes. People with HIV (the virus that causes AIDS) are protected under several existing laws. The Americans With Disabilities Act (ADA) of 1990 protects people with disabilities (including HIV infection) from discrimination in the workplace and in public accommodations solely on the basis of their disabilities. The ADA provides the most far-reaching protection to date on behalf of people with disabilities.

Another law, the Rehabilitation Act of 1973, protects people with handicaps (including HIV infection) from discrimination in federally funded programs. A third law, the Fair Housing Amendments Act of 1988, protects people with disabilities (including HIV infection) from discrimination by private landlords and owners.

No law offers complete protection from discrimination. Like other groups of people who have faced discrimination, people with HIV, their families, and even people incorrectly thought to have HIV have been—

- Evicted from their apartments or houses.
- Refused access to medical care (hospital, nursing home, hospice, dentist, and physician services).
- Refused access to schools and education.
- Refused jobs or removed from them.
- Denied private services, such as funeral and burial services.

Questions have been raised about the extent of legal protection for people with certain disabilities, including HIV infection.

Sources: Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.
U.S. Congress. Americans With Disabilities Act of 1990. Public Law 101-336.
U.S. Congress. Civil Rights Restoration Act of 1987. Public Law 100-259.

Can people be fired because they have AIDS?

DETAILED	BASIC
DETAILED: Not in most workplaces. There are federal and many state and local laws forbidding the firing of employees who have HIV solely because they are infected. Since July 1994, the Americans With Disabilities Act (ADA) of 1990 has applied to employers with 15 or more full-time employees. Nearly every state and many local jurisdictions have laws prohibiting employers from discriminating against people with disabilities, including people who have HIV, the virus that causes AIDS. A business or corporation that receives federal funds or contracts cannot discriminate against people with HIV infection, no matter where the business is located. In such workplaces, people with HIV cannot be fired solely because they have the virus. However, questions have been raised about the extent of legal protection for people with certain disabilities, including HIV infection. The ADA requires that employers in workplaces receiving federal funds make "reasonable accommodation," such as changing work schedules or adapting facilities, for people with disabilities to allow them to work as long as possible. If an employer and employee cannot agree on reasonable accommodation or if an employee can no longer do the work, an employer may legally end employment.	BASIC: Not in most workplaces. In most states and in workplaces that have a certain number of full-time employees or that receive federal funds or contracts, people who have HIV (the virus that causes AIDS) cannot be fired solely because they have HIV.

Sources: Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.

U.S. Congress. Americans With Disabilities Act of 1990. Public Law 101-336.

Journal of the American Medical Association, 1989; vol. 261, no. 11. "Public Health Strategies for Confronting AIDS: Legislative and Regulatory Policy in the United States." Gostin, L.

How does AIDS affect the workplace?

Basic: AIDS is caused by a virus (HIV) that has infected many people of working age. AIDS is a workplace concern, now and in the future.

Detailed: AIDS is caused by a virus (HIV) that has infected many people of working age. AIDS is a workplace concern, now and in the future. Reasons include the following:

- HIV infection is a leading cause of death among Americans 25 to 44 years old, an age group that forms a large part of the workforce.
- Treatments for HIV infection have dramatically improved, making it likely that more employees who have HIV or who have developed AIDS will be living and working longer than before.
- HIV-related costs may rise in areas such as health and disability insurance, pensions, employee replacement and retraining, loss of productivity, and legal actions.
- The Centers for Disease Control and Prevention (CDC) estimates that 67 percent of companies with more than 2,500 employees and about 8 percent of companies with fewer than 500 employees have (or have had) an employee who has HIV or who has developed AIDS. These rates will grow.

Sources: Centers for Disease Control and Prevention. *Monthly Vital Statistics Report,* 1997; vol. 46, no. 2.
Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology, 1997; vol. 16, no. 1. "Updates of Cost of Illness and Quality of Life Estimates for Use in Economic Evaluations of HIV Prevention Programs." Holtgrave, D.R., and Pinkerton, S.D.
National Commission on AIDS. *HIV/AIDS: A Challenge for the Workplace.* June 1993.

Why don't we have mandatory testing for AIDS?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Mandatory testing would require people to be tested for signs of HIV. Mandatory testing programs are in place in several government agencies, among them the Department of Defense, Department of State, Peace Corps, and Job Corps. However, public health experts believe that more generalized mandatory HIV-antibody testing would not be an effective way to stop the spread of HIV, for the following reasons:

- People would have to be retested at regular intervals to see if they had become infected since their last tests.
- Some recently infected people would test negative even though they had the virus. Most people develop HIV antibodies within three months of becoming infected. These people would wrongly believe that they do not have HIV and might not take steps to protect their partners from becoming infected. In addition, hospital workers and others who take care of HIV-infected people might ignore universal precautions.
- Mandatory testing lessens the motivation to change behavior. When testing is voluntary, people get tested because they are concerned about their health and their risk of HIV infection. However, because mandatory testing requires people to participate, they are less likely to heed messages about ways to prevent the spread of HIV.
- Mandatory testing of large numbers of people would cost millions of dollars. Much of this money would probably be taken from more worthwhile education and voluntary testing efforts.

Some evidence suggests that mandatory testing of the general population would be very expensive and would find relatively few cases of HIV infection. Early in the epidemic, for example, the state of Illinois enacted a law requiring mandatory testing of couples applying for marriage licenses. Evaluation of the law's impact found that it cost $312,000 for each person with HIV found during the first six months after the law went into effect. Only eight cases of HIV were found. Counseling and testing centers, however, spent less than $2,000 per antibody-positive person found, and they identified many more people with HIV. Illinois repealed the law.

Public health experts say that prevention education and voluntary testing are more effective against the virus than mandatory testing.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Public health experts say that prevention education and voluntary testing are more effective against the virus than mandatory testing.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.
National Research Council. *The Social Impact of AIDS in the United States.* 1993.
Journal of the American Medical Association, 1989; vol. 261, no. 23. "Mandatory Premarital Testing for Human Immunodeficiency Virus: The Illinois Experience." Turnock, B., and Kelly, C.

To protect patients, why don't we test health care workers for HIV?

BASIC: Patients are protected by the same infection-control procedures that protect health care workers on the job.

DETAILED: Patients are protected by the same infection-control procedures that protect health care workers on the job. Infection control procedures include universal precautions and guidelines covering work involving exposure to blood issued by the Occupational Safety and Health Administration (OSHA).

A public debate over whether patients have a right to know the HIV status of their health care providers followed widespread media coverage of an infected dentist's transmission of HIV to several patients in Florida. After studying the issue, the National Commission on AIDS concluded that a general policy requiring health care providers with HIV to disclose their HIV status to patients would not make medical or dental settings any safer.

The commission estimated that it would cost $250 million to test all health care workers in the United States just one time. Even if paired with a similar program for patients (costing $1.5 billion), only four or five cases of HIV infection would be prevented each year.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Commission on AIDS. *Preventing HIV Transmission in Health Care Settings.* July 1992.

I've heard of needle exchanges. What are they?

Detailed: Needle exchanges are a part of a comprehensive program to prevent the spread of HIV (the virus that causes AIDS) among people who inject drugs. For people who are unable or unwilling to stop using drugs or to get treatment, needle exchanges offer the option of trading new, sterile needles and syringes for used ones. Such programs reduce the need for sharing equipment and can also refer people who inject drugs to drug treatment and other health care services.

Much evidence shows that needle exchanges help reduce the spread of HIV. As a result of a model program in New Haven, Connecticut, the number of new HIV infections decreased by an estimated one-third in one year. After reviewing research on needle exchange in 1997, an expert panel of the National Institutes of Health recommended that the strategy be implemented at once.

Making sterile needles and syringes available to people who inject drugs is a controversial HIV prevention strategy. Many states have laws prohibiting the sale of needles and syringes without a prescription or prohibiting the possession of needles and syringes unless medically necessary. Also, some people fear that needle exchanges will increase injection drug use and the number of users. Many studies, however, have shown that needle exchanges—

- Do not lead to increased injection drug use.
- Do reduce drug-using behavior, such as needle sharing, that spreads HIV.

Although the number of needle exchanges in the United States is not known, by late 1996, 101 exchanges were part of a national network.

Basic: As part of a comprehensive HIV prevention program, needle exchanges give people who inject drugs clean, unused needles and syringes in return for used ones. The availability of new, sterile needles and syringes encourages people who inject drugs not to share their needles and syringes. This gives people who inject drugs a way to protect themselves and others from HIV (the virus that causes AIDS). Needle exchanges can also refer people who inject drugs to drug treatment and other health care services.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 24. "Update: Syringe-Exchange Programs—United States, 1996."

National Institutes of Health. "Interventions to Prevent HIV Risk Behaviors." Consensus Development Conference, Bethesda, MD, February 11–13, 1997.

National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.

Journal of the American Medical Association, 1993; vol. 270, no. 4. "AIDS Policy: Two Divisive Issues." Rogers, D., and Osborn, J.

Lurie, P., and Reingold, A. *The Public Health Impact of Needle-Exchange Programs in the United States and Abroad: Summary, Conclusions, and Recommendations.* University of California at Berkeley, School of Public Health, and University of California at San Francisco, Institute for Health Policy Studies. 1993.

U.S. General Accounting Office. *Needle Exchange Programs: Research Suggests Promise as an AIDS Prevention Strategy.* March 1993.

For information on needle exchange programs, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889). For start-up assistance for new syringe programs, contact the North American Syringe Exchange Network (253/272-4857).

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

2

More Facts About the Virus

What is ARC?
What is AIDS-related complex?

DETAILED: ARC stands for AIDS-related complex, an outdated term that was never clearly defined. ARC was formerly used to describe symptoms of infection in people with HIV who had not yet developed AIDS. Generally, the term covered symptoms such as fever, night sweats, diarrhea, unexplained weight loss, and movement or memory problems. In 1987, the Centers for Disease Control and Prevention (CDC) added unexplained weight loss and movement or memory problems to its definition of AIDS.

BASIC: ARC (AIDS-related complex) is an outdated term. In the past, the term was used to describe symptoms of people with HIV who had not yet developed AIDS.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed. 1992.
National Academy of Sciences. *Confronting AIDS: Update 1988.* 1988.

How many men have AIDS?
How many women have AIDS?

BASIC: As of December 1997, 534,532 men and teenage boys and 98,468 women and teenage girls in the United States were reported to have AIDS (a result of HIV infection).

DETAILED: **Men and teenage boys with AIDS** 534,532
As of December 1997, men and teenage boys accounted for 84 out of every 100 people over age 13 reported to have AIDS in the United States (84 percent).

Women and teenage girls with AIDS 98,468
As of December 1997, women and teenage girls accounted for 16 out of every 100 people over age 13 reported to have AIDS in the United States (16 percent).

Among people with AIDS in the United States, the percentage of women and teenage girls is growing. Comparing new AIDS cases reported in 1985 with those in 1997, the percentage tripled, from 7 percent to 22 percent.

After someone is infected with HIV, it may be a long time before he or she develops AIDS (a result of HIV infection). These statistics, therefore, reflect HIV transmission patterns of the earlier years of the epidemic.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. *Facts.* April 1997.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How many people in the United States have died of AIDS?

DETAILED: As of December 1997, 390,692 men, women, and children in the United States had died of AIDS (a result of HIV infection). This figure represents 60 percent of all people reported to have AIDS and includes all who have died of AIDS.

AIDS is a leading cause of death among all Americans between 25 and 44 years of age. However, in 1996, fewer people died of AIDS than in 1995, likely due to improved medical care.

BASIC: As of December 1997, 390,692 men, women, and children in the United States had died of AIDS (a result of HIV infection). This figure includes all reported deaths from AIDS.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 8. "Update: Trends in AIDS Incidence, Deaths, and Prevalence—United States, 1996."
Centers for Disease Control and Prevention. *Monthly Vital Statistics Report,* 1997; vol. 46, no. 2.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Where are most AIDS cases in the United States found?

DETAILED: New York City has more cases of AIDS (a result of HIV infection) than any other city in the nation. The state of New York has more than any other state. As of December 1997, California, Florida, New Jersey, New York, and Texas accounted for 58 percent of all AIDS cases in the United States. This percentage, however, falls each year as more new AIDS cases occur in other states and cities. No state is free of AIDS or HIV infection. All states, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, and the Trust Territories (Pacific Islands) have reported AIDS cases.

BASIC: As of December 1997, the following states accounted for 58 percent of all AIDS cases:

- California
- Florida
- New Jersey
- New York
- Texas

Source: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Why is AIDS getting so much attention?
Why is there so much concern about AIDS?

Basic: Some reasons for the concern about AIDS (a result of HIV infection) are as follows: AIDS was unknown until 1981, and it is usually fatal; HIV (the virus that causes AIDS) is spread from person to person, and HIV infection is always harmful; and most people with HIV or AIDS are relatively young.

Detailed: Between 650,000 and 900,000 people in the United States are estimated to be infected with HIV (the virus that causes AIDS). As of December 1997, 641,086 HIV-infected people had developed AIDS (a result of HIV infection) and 390,692 had died.

Some reasons for the concern about HIV and AIDS are as follows: AIDS was unknown until 1981, and it is usually fatal; HIV (the virus that causes AIDS) is spread from person to person, and HIV infection is always harmful; and most people with HIV or AIDS are relatively young. Improved treatments are bringing hope to many people with HIV and AIDS.

HIV and AIDS are having an increasingly severe impact on the world community, especially in countries already hard-pressed to meet their citizens' health and medical needs. Most of the people in the world living with HIV or AIDS are in developing countries. Experts predict that by the year 2000, 5 million to 10 million children will be orphaned because of HIV. Effective prevention education can help slow the worldwide spread of HIV infection.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Journal of the American Medical Association, 1996; vol. 276, no. 2. "Prevalence of HIV Infection in the United States, 1984 to 1992." Karon, J.M., et al.
Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.

What are the signs and symptoms of AIDS?

DETAILED: AIDS is a result of HIV infection. HIV-infected people have different signs and symptoms as their infection worsens. However, only a doctor can tell what the signs and symptoms mean. At first, many people with HIV have flu-like symptoms, followed by a period of no symptoms at all. As a result, people may not even know they have HIV infection. Later, some people may have severe or prolonged—

- Fever.
- Fatigue.
- Diarrhea.
- Skin rashes.
- Night sweats.
- Loss of appetite.
- Swollen lymph glands.
- Significant weight loss.
- White spots in the mouth or vaginal discharge (signs of yeast infection).
- Memory or movement problems.

People with AIDS may suffer from a variety of opportunistic infections, as well as from cancers (including invasive cervical cancer in women, Kaposi's sarcoma, and lymphoma), pneumonias, and tuberculosis. Many of these illnesses do not readily occur in someone with a healthy immune system. In addition, people with AIDS may have trouble with certain body organs, such as the lungs, liver, kidneys, intestines, and heart. Each person with AIDS may have a distinct set of signs and symptoms.

People need to know these things:

1. Even if they look and feel healthy, all HIV-infected people (even those who are on combination therapy) should be considered able to infect others with the virus.
2. Having the signs or symptoms listed above may indicate symptomatic HIV infection or AIDS.

BASIC: Only a doctor can tell if someone has AIDS (a result of HIV infection). At first, many people with HIV begin by having flu-like symptoms, followed by no signs or symptoms at all. Later, some people may have severe or prolonged—

- Fever.
- Fatigue.
- Diarrhea.
- Skin rashes.
- Night sweats.
- Loss of appetite.
- Swollen lymph glands.
- Significant weight loss.
- White spots in the mouth or vaginal discharge (signs of yeast infection).
- Memory or movement problems.

In addition, people with AIDS may suffer from infections that most healthy people resist (opportunistic infections), as well as from cancer (including Kaposi's sarcoma, lymphoma, and invasive cervical cancer in women), pneumonias, and tuberculosis.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992.

I have no symptoms. Does that mean I don't have AIDS?

Basic	Detailed
Basic: AIDS is a result of infection caused by a virus (HIV). Having no symptoms does not necessarily mean that people do not have HIV. Many people who have the virus look well and feel healthy for a long time. However, if people have no symptoms and have not shared needles and syringes or had sex with an HIV-infected person, they probably do not have the virus.	Detailed: AIDS is a result of infection caused by a virus (HIV). If people have no symptoms and have not shared needles and syringes or had sex with an HIV-infected person, they probably do not have the virus. Unless people have HIV, they cannot develop AIDS. If people have shared needles and syringes or had sex with an HIV-infected person, they may have the virus. Having no symptoms does not necessarily mean that people do not have HIV. Many people who have the virus look well and feel healthy for a long time. If people think they might be infected with HIV, they are encouraged to be tested and receive counseling as soon as possible. This is the only way to tell whether they have the virus. Because treatments have greatly improved, people with HIV who know that they are infected can seek medical care as soon as possible to protect their health. People should not donate blood in order to find out their HIV status. They can call their local Red Cross or health department to find out where testing is available.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992; 2nd ed., 1988.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What changes did CDC make in 1993 to the definition of AIDS?

Detailed	Basic
DETAILED: The case definition of AIDS (a result of HIV infection) is part of the AIDS case-reporting system at the Centers for Disease Control and Prevention (CDC). In 1993, CDC expanded its definition of AIDS to include more clinical conditions that indicate damaged immune systems. In addition to other already-listed clinical conditions (such as *Pneumocystis carinii* pneumonia, toxoplasmosis, and Kaposi's sarcoma), the revised AIDS definition now includes HIV-infected people with— • Pulmonary tuberculosis. • Recurrent pneumonia. • Invasive cervical cancer. • T-helper cell counts below 200 (or T-helper cell percentages below 14).	BASIC: In 1993, the Centers for Disease Control and Prevention (CDC) added pulmonary tuberculosis, recurrent pneumonia, invasive cervical cancer, and T-helper cell counts below 200 (or T-helper cell percentages below 14) to the list of clinical conditions used as part of the definition of AIDS, a result of HIV infection.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1992; vol. 41, no. RR-17.

Can only people with AIDS infect other people?

Detailed	Basic
DETAILED: No. People with HIV (the virus that causes AIDS), including people on combination therapy, should be considered able to infect others, whether or not they have developed AIDS. At the beginning of HIV infection, the virus enters a person's white blood cells and multiplies. Infected white blood cells and the viruses they produce travel all over the body and appear in certain body fluids, especially blood, semen, vaginal fluid, and breast milk. Thus, long before showing any symptoms of AIDS, people could have HIV in these fluids and could infect others through blood-to-blood or sexual contact.	BASIC: No. All people with HIV (the virus that causes AIDS), even if they are on combination therapy, should be considered able to infect others. Even someone who looks and feels well can, if infected, spread the virus to another person through sexual or blood-to-blood contact. A person may have HIV for years before developing signs or symptoms of AIDS.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
Centers for Disease Control and Prevention. *MMWR,* 1988; vol. 37, no. 24.

Do people survive AIDS?

BASIC: AIDS is a result of HIV infection. By the time people with HIV develop AIDS, their immune systems are already weakened. As a result, their bodies are vulnerable to infections and other diseases. However, with good medical care, people with AIDS can expect to survive for several years. Without combination therapy, only a few people who have HIV show no evidence of disease progression many years after becoming infected. A National Institutes of Health (NIH) panel in 1997 emphasized that people with HIV, even if they benefit from combination therapy, should be considered able to infect others and should be encouraged to adopt and maintain prevention behavior.

DETAILED: AIDS is a result of HIV infection. HIV infection is always harmful. By the time HIV-infected people develop AIDS, their immune systems are already weakened. As a result, their bodies are vulnerable to infections and other disease. However, with good medical care, including combination therapy to suppress the virus and treatments to prevent or control opportunistic infections, people with AIDS can expect to survive for several years.

From many studies of people with HIV over long periods of time, scientists know that about 5 percent of people who have HIV are "long-term nonprogressors." Without treatment to suppress the virus, they show no evidence of disease progression for 7 years or more after becoming infected, and their immune systems remain stable. A National Institutes of Health (NIH) panel in 1997 set the number of true long-term survivors at about 2 percent.

Although knowledge about HIV infection is growing and treatments are improving greatly, scientists do not yet know if people can overcome the effects of the virus and live a normal life span. The net impact of improved treatments has yet to be seen, and the search continues for more drugs that attack the virus itself. The NIH panel emphasized that people with HIV, even if they benefit from combination therapy, should be considered able to infect others and should be encouraged to adopt and maintain prevention behavior.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

Can people become immune to AIDS?

DETAILED: AIDS is a result of HIV infection. Developing immunity to HIV (the virus that causes AIDS) would mean that a person infected with HIV was able to get rid of the infection or control it. Immunity to most diseases involves having antibodies and cell defenses ready to fight germs. In most people, the immune system produces antibodies to HIV that keep it in check at first, but the virus eventually takes over. Also, the virus is able to alter itself slightly as it reproduces, helping the virus escape control by the body's immune system.

Although HIV damages the immune systems of most people who are infected, scientists are studying people with HIV whose immune systems are strong, showing no development of disease for more than seven years. They are also studying people who have been exposed to HIV but seem to be able to resist it. By learning more about the immune systems and genetic factors of people who seem to resist the virus and about the make-up of the virus, scientists may be able to develop a successful vaccine against HIV.

BASIC: AIDS is a result of HIV infection. Developing immunity to HIV (the virus that causes AIDS) would mean that a person infected with HIV was able to get rid of the infection or control it. Although HIV damages the immune systems of most people who are infected, scientists are studying some people who show no signs of illness many years after becoming infected. They are also studying some people who have been exposed to HIV but have not become infected.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Long-Term Survivors of HIV-1 Infection: Definitions and Research Challenges." Schrager, L.K., et al.

Why don't antibodies to HIV protect people from AIDS?

BASIC: After someone is infected with HIV (the virus that causes AIDS), antibodies usually develop quickly in the body. Although these antibodies are very useful for detecting infection, they do not effectively keep HIV from multiplying nor disease from developing over time.

DETAILED: AIDS is a result of infection caused by a virus (HIV). People who have HIV develop high levels of antibodies that ought to keep the virus in check. Eventually, however, the virus takes over. Scientists are not completely sure why this occurs. In laboratory studies, researchers have discovered that HIV can survive the body's defenses in several ways, including the following:

- Early in infection, HIV spreads in lymphoid tissues, such as the lymph nodes, where it infects T-cells, dendritic cells, and other white blood cells. Because these tissues are shielded from antibodies circulating the bloodstream, the virus can replicate to very high levels.
- Very high rates of HIV and cell turnover happen after someone is infected with HIV. As many as 100 million to 1 billion virus particles and cells are produced and destroyed every day. As long as the body is able to recognize and clear infected cells and virus, it is able to fight the infection. Over time, however, the infection weakens this ability.
- When HIV is present, white blood cells that ordinarily trigger general antibody production (T-helper cells and others) do not function as well as they should. They do not activate the cells that make antibodies, and the body is less protected from other infections.
- The virus seems able to alter itself slightly as it reproduces. This may help the virus escape control by antibodies and other parts of the body's immune system.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
Janeway, C., Jr., and Travers, P. *Immunobiology: The Immune System in Health and Disease,* 3rd ed. 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed. 1992.

I have heard that there is a second AIDS virus, called HIV-2. Is this true?

DETAILED: HIV-2 (human immunodeficiency virus type 2) and HIV-1 (usually referred to as "HIV, the virus that causes AIDS") are closely related viruses that cause AIDS. There are several countries in West Africa and in other parts of Africa where HIV-2 prevalence is more than 1 percent in the general population. Few cases of HIV-2 infection exist in the United States. By June 1992, blood centers in the United States were testing all donated blood for signs of HIV-1 and HIV-2.

BASIC: HIV-2 (human immunodeficiency virus type 2) and HIV-1 (usually referred to as "HIV, the virus that causes AIDS") are closely related viruses that cause AIDS.

Sources: Centers for Disease Control and Prevention. "Human Immunodeficiency Virus Type 2." April 1998.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Epidemiology and Natural History of HIV-2." Kanki, P.J., and De Cock, K.M.

Is HIV-2 a problem in this country?

DETAILED: For the most part, HIV-2 is found in parts of West Africa. Only 77 cases of HIV-2 infection have been reported in the United States, from the first case in 1987 through December 1997. Even though there are few cases, the Centers for Disease Control and Prevention (CDC) continues to monitor the presence of HIV-2.

By June 1992, blood centers had begun testing all donated blood for signs of both HIV-1 and HIV-2. Not having sex and not sharing needles and syringes with people who are infected prevents the spread of both HIV-1 (usually referred to as "HIV, the virus that causes AIDS") and HIV-2.

BASIC: Few cases of HIV-2 infection exist outside parts of West Africa, and cases are rare in the United States. By June 1992, blood centers had begun testing all donated blood for signs of both HIV-1 and HIV-2. Prevention strategies are the same for HIV-2 as for HIV-1 (usually referred to as "HIV, the virus that causes AIDS").

Sources: Centers for Disease Control and Prevention. "Human Immunodeficiency Virus Type 2." April 1998.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Epidemiology and Natural History of HIV-2." Kanki, P.J., and De Cock, K.M.

Does HIV-2 cause symptoms that are different from HIV-1?

Basic: Evidence suggests that the symptoms of HIV-2 and HIV-1 (usually referred to as "HIV, the virus that causes AIDS") differ by degree. However, HIV-2, like HIV-1, can destroy the body's defense system.

Detailed: Both HIV-1 (usually referred to as "HIV, the virus that causes AIDS") and HIV-2 damage various body systems, including the immune system, leaving the body vulnerable to opportunistic infections. HIV-2, like HIV-1, can destroy the body's defense system.

Studies comparing patterns of infection with HIV-1 and HIV-2 in Dakar, Senegal, have shown that—

- Although HIV-1 and HIV-2 are spread in the same ways, the rate of HIV-1 transmission is higher than that of HIV-2.
- People who are infected with HIV-1 develop AIDS earlier than people with HIV-2.
- People with HIV-2 who develop AIDS may survive longer than people with HIV-1 who develop AIDS.
- People who are infected with HIV-2 may be protected from HIV-1.

Learning more about this may help scientists develop a successful vaccine.

Sources: Centers for Disease Control and Prevention. "Human Immunodeficiency Virus Type 2." April 1998.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Epidemiology and Natural History of HIV-2." Kanki, P.J., and De Cock, K.M.

When was the first AIDS test developed?

Basic: Current tests in general use detect antibodies to HIV (the virus that causes AIDS) rather than the virus itself. The first antibody test, called the ELISA, a kind of EIA, was licensed in 1985.

Detailed: Currently, the test in general use detects antibodies to HIV (the virus that causes AIDS) rather than the virus itself. In 1985, the Food and Drug Administration (FDA) quickly approved and licensed the first antibody test, known as the ELISA (a kind of EIA), to protect the blood supply and blood products. With the ELISA, the Red Cross and other blood banks began screening all blood collected, using other antibody tests such as the Western blot to confirm positive or unclear (indeterminate) results.

Since 1985, the EIA has improved and tests that look for other signs of the virus have been developed. The EIA is still the standard screening test used for detecting the presence of HIV. The EIA is followed by the Western blot or other test to confirm results that show the presence of HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Food and Drug Administration. "Testing for Antibodies to HTLV-III." Memorandum. May 1985.

What does AIDS have to do with the immune system?

DETAILED: AIDS is a result of infection caused by a virus (HIV). HIV affects certain parts of the immune system: T-cells, B-cells, dendritic cells, and monocytes/macrophages. These cells are collectively referred to as white blood cells.

- **T-cells** serve many functions: signaling macrophages and certain kinds of T-cells to attack germs, helping trigger B-cell functioning, and serving as the general control mechanism for slowing or speeding up the immune system.
- **B-cells** make antibodies, substances that defend the body against anything foreign.
- **Dendritic cells** carry germs from the point of infection to the lymph nodes and trigger T-cell response.
- **Monocytes/macrophages** surround and devour infected cells, germs, and dead material.

Lymphatic vessels carry white blood cells into the bloodstream and to organs involved in the body's defenses, such as the lymph nodes. Lymphatic vessels also help remove germs from the body. Dendritic cells bring HIV to the lymph nodes, where it can multiply to high levels, away from antibodies and other host defenses in the blood.

Although they attempt to fight HIV, white blood cells are often defeated by the virus, which eventually cripples the immune system. This is what scientists believe at present:

- One class of T-cells (T-helper cells) serves as the main target (host cell) for HIV. The virus enters the genetic information of the T-helper cells and never leaves. When activated, HIV multiplies and the new viruses infect many more T-helper cells. By causing them to split or clump together, HIV slowly destroys the functioning of these T-cells so that they no longer trigger antibody production or signal attacks against germs.
- Macrophages also serve as host cells for HIV.

HIV hinders and often destroys the immune system by crippling its defenses. People with HIV who have developed AIDS lose their protection against the invasion of germs, which cause illness.

BASIC: AIDS is a result of infection caused by a virus (HIV). The virus weakens and eventually destroys the immune system. When a person with HIV develops AIDS, his or her body has lost most of its ability to attack germs directly.

Sources: HIV/AIDS Treatment Information Service. *Glossary of HIV/AIDS-Related Terms,* 2nd ed. March 1997.
Janeway, C., Jr., and Travers, P. *Immunobiology: The Immune System in Health and Disease,* 3rd ed. 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed. 1992.

Do all people with opportunistic infections have AIDS?

BASIC	DETAILED
BASIC: No.	DETAILED: No. A person who has a damaged immune system, regardless of the cause, can have opportunistic infections. Besides HIV infection, other conditions can suppress the immune system. For example, people who have cancer or transplanted organs can get opportunistic infections because their illnesses or medications suppress their immune systems.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 1S.

What infections do most people with AIDS get most often?

DETAILED: By the time people with HIV develop AIDS (a result of HIV infection), their immune systems are usually severely damaged. People with HIV may suffer from a variety of infections caused by certain fungi, parasites, viruses, and bacteria. People with AIDS can have more than one infection at a time. Doctors now can treat or even prevent many of these infections.

Earlier in the epidemic, at least 80 percent of people with AIDS suffered from *Pneumocystis carinii* pneumonia. This figure has greatly decreased, but this disease still accounts for the largest number of opportunistic infections, even though it is preventable. In addition to *Pneumocystis carinii* pneumonia, the following infections are commonly seen in people with AIDS:

- Systemic herpes (sores that heal very slowly, found especially on the genitals and anus and in the mouth)
- Candidiasis (including vaginal "yeast" and thrush, which causes white patches in the mouth that can extend down the throat and into the esophagus)
- Cytomegalovirus infection (most commonly found in the eye, gastrointestinal system, and central nervous system)
- Tuberculosis (TB) (an infection of the lungs and sometimes other organs, caused by mycobacteria, not strictly classified as an opportunistic infection)
- *Mycobacterium avium* complex (MAC) (caused by mycobacteria that resemble TB, which appears in people whose immune systems are badly damaged; causes fever, weight loss, weakness, and sometimes diarrhea)
- Recurrent pneumonia (a bacterial lung infection causing fever, shortness of breath, and a productive cough)
- Cryptococcosis (a fungal infection that can cause pneumonia or meningitis and inflammation of the brain)

Some of these infections can appear in people with healthy immune systems. When they appear in people with HIV infection (or in those whose immune systems are suppressed by medication), however, these infections tend to be more severe, more widespread, and more difficult to treat.

BASIC: People with AIDS (a result of HIV infection) may get tuberculosis, *Mycobacterium avium* complex (MAC), herpes, thrush, *Pneumocystis carinii* pneumonia, or cytomegalovirus infection, among other infections. Although some of these infections appear in people with healthy immune systems, they are often more severe in people with AIDS. Doctors now can treat or even prevent many of these infections.

Source: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

What is *Pneumocystis carinii* pneumonia? Isn't it just another form of pneumonia?

BASIC: *Pneumocystis carinii* pneumonia is caused by a fungus. Doctors now can treat or even prevent this type of pneumonia.

DETAILED: *Pneumocystis carinii* pneumonia is caused by a fungus. Although people with healthy immune systems can control this fungus, people who have developed AIDS (a result of HIV infection) cannot keep *Pneumocystis carinii* from multiplying. Living in the lungs, this fungus makes breathing difficult. Although *Pneumocystis carinii* pneumonia is still the most common opportunistic infection among people with AIDS in the United States, doctors now can treat or even prevent this type of pneumonia.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

What is Kaposi's sarcoma?

BASIC: Kaposi's sarcoma is a type of cancer of the blood vessels that affects the skin and internal body parts. Earlier in the epidemic, many people with AIDS (a result of HIV infection) in the United States had Kaposi's sarcoma. However, the cancer is less common now in people recently diagnosed with AIDS.

DETAILED: A type of cancer of the blood vessels, Kaposi's sarcoma is one of the conditions that defines AIDS (a result of HIV infection) in people who have HIV. In the early years of HIV infection in the United States, Kaposi's sarcoma was common among people with AIDS, particularly in men who had sex with men.

The form of Kaposi's sarcoma that people with HIV get causes red or purplish spots (lesions) on the skin. This form of Kaposi's sarcoma can also appear as lesions in the lymph nodes, inside the lungs, along the digestive tract, or in the mouth.

Currently, Kaposi's sarcoma affects fewer people with AIDS than it did early in the epidemic, when 35 percent to 40 percent had it. The number of people with AIDS who have Kaposi's sarcoma in recent years has greatly decreased. The reason for this decline is not clear. One possibility is that the decline is a result of more prevention behavior on the part of men who have sex with men.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Which drugs are most commonly used to fight infections in people with AIDS?

DETAILED: To prevent or fight opportunistic infections among people with HIV who have developed AIDS, doctors use many drugs:

- ***Pneumocystis carinii* pneumonia.** Trimethoprim-sulfamethoxazole. Alternatives include dapsone (alone or with pyrimethamine and leucovorin) and aerosolized pentamidine using certain nebulization devices.
- ***Mycobacterium avium* complex (MAC).** Clarithromycin, azithromycin.
- **Herpes.** Oral acyclovir, intravenous foscarnet, cidofovir.
- **Cytomegalovirus infection.** Oral or parenteral ganciclovir, parenteral foscarnet (alone or with parenteral ganciclovir).
- **Candidiasis.** Fluconazole, ketoconazole, itraconazole.
- **Tuberculosis.** Isoniazid with pyridoxine (and other drugs when drug resistance is suspected).
- **Cryptococcosis.** Fluconazole, itraconazole.

This list contains only some of the available treatments and will change as researchers discover new drugs.

Treatments for some opportunistic infections have improved, contributing to a decrease in new cases of these infections. By monitoring the levels of certain cells (such as T-helper cells) in the immune system, doctors know when to offer various infection fighting drugs to prevent or reduce the effects of illness. Treatments, however, are needed for other opportunistic infections.

Many drugs used to fight opportunistic infections and HIV can cause serious side effects. Scientists are trying new techniques, such as having patients alternate between drugs, to reduce each drug's toxicity. Some drugs used against opportunistic infections react negatively with drugs that attack HIV itself. For this reason, rifampin is not used at the same time as protease inhibitors.

BASIC: Following are some of the opportunistic infections and drugs used to prevent, suppress, or treat them:

- ***Pneumocystis carinii* pneumonia.** Trimethoprim-sulfamethoxazole. Alternatives include dapsone (alone or with pyrimethamine and leucovorin) and aerosolized pentamidine using certain nebulization devices.
- ***Mycobacterium avium* complex (MAC).** Clarithromycin, azithromycin.
- **Herpes.** Oral acyclovir, intravenous foscarnet, cidofovir.
- **Cytomegalovirus infection.** Oral or parenteral ganciclovir, parenteral foscarnet (alone or with parenteral ganciclovir).
- **Candidiasis.** Fluconazole, ketoconazole, itraconazole.
- **Tuberculosis.** Isoniazid with pyridoxine (and other drugs when drug resistance is suspected).
- **Cryptococcosis.** Fluconazole, itraconazole.

Source: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no RR-12. "1997 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus."

For additional information on alternative treatments and therapy options, contact Project Inform (800/822-7422) or its Website at www.projinf.org.

Is there any way to treat Kaposi's sarcoma?

Basic: Yes. With alpha interferon, chemotherapy, radiation, and cryotherapy (freezing).

Detailed: Doctors use the following therapies to treat Kaposi's sarcoma:

- Alpha interferon, which boosts the immune system
- Systemic chemotherapy, using low-dose ABV (adriamycin, bleomycin, and vincristine) or oral etopside
- Radiation therapy
- Cryotherapy (liquid-nitrogen freezing)

These treatments have had some success in controlling the spread of Kaposi's sarcoma in people with AIDS (a result of HIV infection). Scientists are still experimenting with other anticancer agents, trying to discover a more effective treatment. For instance, human chorionic gonadotropin (hCG) and retinoids are treatment possibilities under study.

Source: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

How do people with AIDS get access to experimental drugs or vaccines?

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). People who have HIV must apply and qualify for experimental drug and vaccine trials. In 1997, 124 new medicines and vaccines were in development. The government has created programs to help people with HIV infection and other illnesses gain access to experimental treatments. These programs include the following:

- **AIDS Clinical Trials Groups.** These groups provide federally funded randomized clinical trials for new drugs that have shown some effectiveness against HIV infection. Directed by the National Institutes of Health (NIH), these groups cover adults and children.
- **Terry Beirn Community Programs for Clinical Research on AIDS.** These programs involve community-based physicians in research on HIV infection. The programs broaden participation in new studies on experimental drugs to include areas where clinical trials are usually not available.
- **Parallel Track.** This program is intended to make experimental drugs still under development more widely available to people with advanced disease who have no satisfactory drug alternatives and cannot participate in clinical studies.
- **HIVNET.** This program, which began in 1993, conducts large-scale clinical trials on vaccines and other prevention strategies in the United States and elsewhere.
- **Treatment Investigational New Drug (IND) Program.** This program, created by the Food and Drug Administration (FDA), gives patients with life-threatening illnesses access to experimental drugs and vaccines. Through this program, drug companies can ask that doctors be allowed to provide interested patients with a drug still undergoing clinical trials.

Timely access to new drugs has been enhanced by the accelerated approval of new drugs to help people with life-threatening illnesses. This FDA procedure allows experimental drugs to be approved when research shows signs of clinical benefits. Drugs can be removed from the market if further research does not confirm benefits.

Basic: The government supports several programs that help people gain access to experimental drugs and vaccines.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Pharmaceutical Research and Manufacturers of America. *New Medicines for AIDS in Development.* November 1997.
National Institute of Allergy and Infectious Diseases. "NIAID Resources for Studying HIV/AIDS in Women." Fact sheet. April 1997.
HIV/AIDS Treatment Information Service. *Glossary of HIV/AIDS-Related Terms,* 2nd ed. March 1997.
Food and Drug Administration. "Expanded Access and Expedited Approval of New Therapies Related to HIV/AIDS." Fact sheet. June 1996.

For information on clinical trials of experimental drugs and other therapies for adults and children, contact the National Institute of Allergy and Infectious Diseases (NIAID) AIDS Clinical Trials Information Service (800/874-2572), TTY/TDD (800-243-7012), or its Website at www.actis.org.

I've heard that people with AIDS are using alternative therapies. What are they?

Basic: Some people with AIDS (a result of HIV infection) use certain therapies in addition to, or instead of, traditional treatments. Among these complementary therapies are—

- Visualization and imaging, believed to direct mental energies toward ridding the body of AIDS symptoms.
- Crystals, believed to focus the body's energy fields into laser-like beams that help heal the body.
- Natural products, believed to strengthen the immune system, including high-dosage vitamins, egg proteins, herbal medicines, and amino acid supplements.
- Acupuncture, believed to influence body energy by means of tiny needles inserted into nerve centers. In 1997, a consensus panel of the National Institutes of Health (NIH) concluded that acupuncture is effective for some conditions, including nausea and vomiting from surgery or chemotherapy.
- Macrobiotics, believed to keep balance within the mind primarily through balance within the diet.

Detailed: Alternative therapies are nonmedical approaches that some people believe treat HIV infection (including AIDS) effectively and help make people with HIV feel better. Some of these therapies include medications the Food and Drug Administration (FDA) has not approved for the treatment of HIV infection. Other therapies are—

- Visualization and imaging, believed to direct mental energies toward ridding the body of AIDS symptoms.
- Crystals, believed to focus the body's energy fields into laser-like beams that help heal the body.
- Natural products, believed to strengthen the immune system, including high-dosage vitamins, egg proteins, herbal medicines, and amino acid supplements.
- Acupuncture, believed to influence body energy by means of tiny needles inserted into nerve centers. In 1997, a consensus panel of the National Institutes of Health (NIH) concluded that acupuncture is effective for some conditions, including nausea and vomiting from surgery or chemotherapy.
- Macrobiotics, believed to keep balance within the mind primarily through balance within the diet.

In general, the safety and effectiveness of complementary therapies have not been scientifically established. It may be harmful to use an alternative therapy if it is unsafe or if it is used in place of prescribed medical care.

In 1992, the Office of Alternative Medicine was established at NIH to study alternatives to conventional medical treatments. This office evaluates new opportunities for medical therapy; holds technology assessment conferences on Eastern medicine and acupuncture, homeopathic medicine, and physical manipulation therapies; and has established a clearinghouse for information on complementary medical practices and treatment methods.

Sources: National Institutes of Health. "NIH Panel Issues Consensus Statement on Acupuncture." News release. November 5, 1997.
New England Journal of Medicine, 1989; vol. 320, no. 10. "Alternative Therapies Used by Patients With AIDS." Hand, R.
Badgley, L. *Healing AIDS Naturally.* 1987.
O'Connor, T., and Gonzalez-Nuñez, A. *Living With AIDS.* 1987.
National Institutes of Health, Office of Alternative Medicine. Information sheet. No date.

For additional information on alternative treatments and therapy options, contact Project Inform (800/822-7422) or its Website at www.projinf.org, or contact the NIH Office of Alternative Medicine Clearinghouse (888/644-6226) or its Website at altmed.od.nih.gov.

What are "buyers' clubs"?

DETAILED: "Buyers' clubs" are groups that distribute drugs and other products, believed to be useful in treating illness, that do not have approval of the Food and Drug Administration (FDA). Because these drugs and products are not approved by the FDA, they are not legally available in the United States. In the 1980s, buyers' clubs started to offer drugs to people with HIV. Currently, about 15 buyers' clubs exist in the United States.

Products of unknown origin, purity, sterility, and strength can be dangerous to use. Concern about the safety and effectiveness of products distributed by clubs and the lack of adequate supervision by a physician led to these developments in the 1990s:

- The FDA began to inspect buyers' clubs and to warn them about unsafe or dangerous products being distributed.
- Some clubs drafted guidelines known as the "Fort Lauderdale Principles," designed to protect people with HIV from being exploited by buyers' clubs.

The FDA is exploring ways to identify products believed to have the greatest medical promise for people with HIV and to help more people gain access to these products as scientific data are gathered.

BASIC: "Buyers' clubs" are groups that distribute drugs and other products to people with HIV. Because they have not been approved by the Food and Drug Administration (FDA), these drugs and products are not legally available in the United States. Drugs of unproven safety and effectiveness may be dangerous to use.

Sources: *American Journal of Health-System Pharmacists,* 1997; vol. 54. "AIDS Buyers' Clubs." DeChristoforo, R., and Minor, J.R.
Food and Drug Administration. "FDA to Inspect AIDS 'Buyers Clubs.'" Talk Paper. October 1991.

Is there a vaccine against AIDS?

BASIC: Not yet. AIDS is a result of HIV infection. To protect against AIDS, therefore, a vaccine has to protect against HIV (the virus that causes AIDS). Although much progress in vaccine research makes some experts hopeful, a great deal more needs to be done. Adopting prevention behavior is still the best tool against HIV.

DETAILED: No effective vaccine against AIDS exists at this time. Because AIDS is a result of HIV infection, a vaccine has to protect people from HIV (the virus that causes AIDS). Most vaccines cause the body to make antibodies to destroy a particular germ if it invades the body. Such an approach has not yet been successful against HIV. Researchers are working on developing vaccines against HIV that can keep the virus from multiplying. Several characteristics of HIV infection and the virus itself make this work difficult:

- The infection is spread both by free virus and through infected cells.
- The virus can hide in cells.
- The virus multiplies quickly in great numbers.
- The virus slows down and destroys the body's defense system.
- The virus can infect and remain in the central nervous system.
- The virus does not infect other animals (except chimpanzees, in which it does not cause the same disease as it does in humans), making research on vaccines harder for lack of a good experimental model.
- The antibodies the virus triggers in the body do not disable the infection.
- The virus mutates and creates slightly different versions of itself.
- There are several different strains of HIV. A vaccine that may work against one strain may not be effective against others.

To be effective, an HIV vaccine may have to achieve three kinds of immunity:

1. Antibody-mediated (humoral) immunity, to protect the body against free virus (HIV that is outside cells)
2. Cell-mediated immunity, to kill cells already infected
3. Mucosal immunity, to protect against infection of organs with mucous linings, such as the rectum and the vagina

As of 1997, more than 10 vaccine candidates were in clinical trials at various stages to assess their safety and effectiveness in achieving immune responses against HIV. Most of these vaccines were made from gp160 or gp120, parts of the protein that covers the virus.

Although these vaccines show promise for the future, adopting prevention behavior is still the best tool against HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Pharmaceutical Research and Manufacturers of America. *New Medicines for AIDS in Development.* November 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Clinical Trials of Candidate AIDS Vaccines." Walker, M.C., and Fast, P.E.

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More Facts About Transmission and Prevention

Who gets AIDS?

DETAILED: Most people who get HIV (the virus that causes AIDS) through exposure to infected blood, semen, vaginal fluid, or breast milk develop AIDS eventually. Good medical care, however, can dramatically extend life and improve the quality of life for people with HIV infection, including people with HIV who have AIDS.

Working with state and local health departments, the Centers for Disease Control and Prevention (CDC) tracks AIDS cases by groups of risk behaviors. As of December 1997, this was the breakdown of AIDS cases among adults and teenagers in the United States:

- Men who have sex with men—49 percent
- People who inject drugs—26 percent
- Combined exposures (men who have sex with men and inject drugs)—6 percent
- Men who have sex with women, and women who have sex with men—9 percent
- People who received transfusions, blood components, or tissue—1 percent
- People who have hemophilia/coagulation disorders—1 percent
- Risk not reported or identified—8 percent

Because these are AIDS cases, they reflect the way HIV was spreading about 10 or more years ago. People become infected most commonly through having sex or sharing needles and syringes with a person who has HIV.

Statistics about AIDS do not include people who have HIV infection but have not yet developed AIDS. If broken into categories, statistics concerning recently infected people would look different from the statistics above. For example, cases of HIV infection from transfusions or blood clotting factors are now quite rare, because blood banks began testing all blood and blood components for HIV antibodies in 1985. Also, new treatments used to produce clotting factors destroy HIV and other germs. Other examples are the growing proportion of HIV cases among people who inject drugs and the shrinking proportion among men who have sex with men.

BASIC: Most people who get HIV (the virus that causes AIDS) through exposure to infected blood, semen, vaginal fluid, or breast milk develop AIDS eventually. Good medical care, however, can dramatically extend life and improve the quality of life for people with HIV infection, including people with HIV who have AIDS. As of December 1997, this was the breakdown of AIDS cases among adults and teenagers in the United States:

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- People who received transfusions, blood components, or tissue—1 percent
- People who have hemophilia/coagulation disorders—1 percent
- Risk not reported or identified—8 percent

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What does "risk not reported or identified" mean as a category? Is AIDS spread through casual contact?

Basic: The "risk not reported or identified" category covers people with AIDS (a result of HIV infection) who were ever unlisted under current risk categories. Further investigation has reclassified many of these people into current categories.

Detailed: The "risk not reported or identified" category covers people with AIDS (a result of HIV infection) who were ever unlisted under current risk categories. The Centers for Disease Control and Prevention (CDC) investigates these cases to determine the route of transmission. By December 1997, there were 90,837 cases under this category. Among these cases—

- About 46 percent were reclassified into current risk categories.
- About 39 percent were still under investigation.
- About 11 percent of the people in this category had died, refused an interview, or become lost to follow-up.

Source: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Is the number of AIDS cases in heterosexuals increasing?

Detailed: Yes. The number of new AIDS cases in the United States among adults and teenagers who have man-woman sex is increasing. As of December 1997, a total of 58,884 people with AIDS (a result of HIV infection) had become infected with the virus through sex between men and women. AIDS statistics do not include those who became infected through man-woman sex but who have not yet shown symptoms of AIDS.

The total number of AIDS cases among men and women who have heterosexual sex is still relatively small. Additional cases create a larger increase in the percentage than they would if the base number of cases were larger. Even so, several factors indicate that HIV transmission from sex between men and women will continue to increase:

- Most people who inject drugs are people who have sex with people of the opposite sex.
- In a national study of injection drug use, the National Institute on Drug Abuse (NIDA) reported that 26 percent of injectors were women, although the figure varies by area. Many of these women exchange sex for drugs or money to buy them.
- Many people with HIV who have sex with people of the opposite sex became infected by having sex with someone who injects drugs.
- The proportion of AIDS cases as a result of HIV transmission through sex between men and women increased from 1995 to 1996, even as proportions decreased for every other risk.

Basic: Yes. The number of new AIDS cases in the United States among adults and teenagers who have man-woman sex is increasing. As of December 1997, 58,884 people with AIDS (a result of HIV infection) had become infected with the virus through sex between men and women. AIDS statistics do not include people who became HIV-infected through man-woman sexual contact but who have not yet shown symptoms of AIDS.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 37. "Update: Trends in AIDS Incidence—United States, 1996."
National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

More Facts About Transmission and Prevention

How do women get AIDS?

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). Women and teenage girls can become infected with this virus through—

- Sharing needles and syringes with someone who has the virus.
- Having sex with someone who has the virus.

Before 1985, when testing began, some women became infected from receiving a blood transfusion or blood component that had the virus. Since 1985, however, this route of transmission has become very rare.

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). Like men, women and teenage girls can become infected with HIV through—

- Sharing needles and syringes with someone who has the virus.
- Having sex with someone who has the virus.

Before 1985, when testing began, some women became infected from receiving blood transfusions, blood components, or tissue that contained the virus. Because blood banks now test all blood for signs of HIV, the risk of receiving infected blood transfusions and blood components is extremely low.

In 1981, the Centers for Disease Control and Prevention (CDC) began to track AIDS, a newly identified syndrome. From 1981 to December 1997, the breakdown of ways in which women and teenage girls with HIV who developed AIDS were infected was as follows:

- 44 percent got the virus through injection drug use.
- 39 percent got the virus through sex with an HIV-infected partner.
- 4 percent got the virus through HIV-infected blood transfusions, blood components, or tissue.
- 13 percent were not classified by risk behavior.

Of the reported AIDS cases among adults and teenagers, the proportion of women and teenage girls has increased steadily each year, rising from 7 percent in 1985 to 20 percent in 1996. HIV infection is the third leading cause of death among women ages 25 to 44 and the leading cause of death among African American women in this age group.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

Centers for Disease Control and Prevention. "HIV/AIDS and Women in the United States: Excerpts from the *HIV/AIDS Surveillance Report.*" July 1997.

Wortley, P., et al. "Epidemiology of HIV/AIDS in Women and the Impact of the Expanded 1993 CDC Surveillance Definition of AIDS." In: *The Medical Management of AIDS in Women.* Cotton, D., and Watts, D., eds. 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Is sex the only way I can get AIDS?

Detailed: No. AIDS (a result of HIV infection) is caused by a virus (HIV). Because HIV is spread through sexual or blood-to-blood contact with a person who has the virus, having sex is not the only way someone can become infected. For example, sharing needles and syringes with an HIV-infected person for any reason—such as for injecting drugs (including steroids) and piercing ears and other body parts—can spread the virus if the needles and syringes are contaminated.

Early in the epidemic, some people became infected with HIV from contaminated blood transfusions or blood components. Since 1985, however, the Red Cross and other blood banks have interviewed donors and screened all donated blood and plasma for signs of HIV. The current risk of HIV transmission from blood transfusions or blood components is extremely low.

To avoid HIV infection, people can decide not to share needles and syringes or not to have sex unless their partners do not have HIV. (It's hard to know for sure whether or not someone has HIV.) If they have sex, they can greatly reduce their risk of getting HIV by using a latex condom the right way every time. If they inject drugs, they can get into treatment to stop. If they cannot or do not wish to stop injecting drugs, they can use new, sterile equipment every time they inject. If they share needles and syringes, they can clean them properly with bleach and water to reduce their risk of HIV infection.

Basic: No. AIDS (a result of HIV infection) is caused by HIV, a virus that is spread through either sexual or blood-to-blood contact with someone who has the virus. People who share needles and syringes with a person who has HIV can also become infected.

Sources: Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.

Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. *HIV/AIDS Prevention Bulletin.* April 19, 1993.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

More Facts About Transmission and Prevention

Why are IV drug users at risk for getting AIDS?

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). People who inject drugs are at risk of becoming infected with HIV because they can inject HIV directly into their bodies if they use needles and syringes contaminated with HIV-infected blood.

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). When injecting drugs, people can put HIV directly into their bodies if they use needles and syringes ("works") contaminated with HIV-infected blood. For example, if a person with HIV uses drug works, his or her blood contaminates the equipment. If the works are not properly cleaned, anyone else who uses them is likely to become infected because the contents of the needle and syringe mix with contaminated blood and are put directly into the blood.

To protect themselves and others from HIV infection, people who inject drugs can try to stop. If they cannot or do not wish to do so, they can use new, sterile equipment every time they inject, instead of sharing or reusing drug equipment. If they do share, they can clean the works with chlorine bleach and water to reduce their risk of HIV infection.

Like anyone else, people who inject drugs can also help protect themselves and others by not having sex unless they know their partners do not have HIV. (It's hard to know for sure whether or not someone has HIV.) If people who inject drugs have sex, using a latex condom the right way every time greatly reduces the risk of HIV infection.

Sources: Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. *HIV/AIDS Prevention Bulletin.* April 19, 1993.

National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

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How are Asians affected by AIDS?

Detailed: Like other people, it is possible for Asians to become infected with HIV (the virus that causes AIDS). As of December 1997, the United States reported 4,545 AIDS cases among adults and teenagers of Asian and Pacific Island descent, less than 1 percent of total AIDS cases in the United States. The Global AIDS Policy Coalition at Harvard University estimated that about 9.5 million adults and children in Asia were infected with HIV at the start of 1992. This group predicted that by the end of the year 2000, there will be more HIV-infected adults living in Southeast Asia than in any other area of the world. HIV and AIDS affect us all, regardless of race or ethnic background.

Basic: Like other people, it is possible for Asians to become infected with HIV (the virus that causes AIDS) if they are exposed to HIV. No one is immune to HIV.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.
Mann, J., et al., eds. *AIDS in the World.* 1992.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How are indigenous communities in the United States affected by AIDS?

Detailed: Like other people, it is possible for Native Americans, Alaska Natives, and Native Hawaiians to become infected with HIV (the virus that causes AIDS) if they are exposed to the virus. As of December 1997, there were 1,783 reported AIDS cases among Native Americans and Alaska Natives; this number is probably smaller than the actual number. Better surveillance data would help target community HIV/AIDS efforts. According to the Centers for Disease Control and Prevention (CDC), HIV counseling and testing, and early and continuing access to medical care, are important to ensure that Native people with HIV can share the benefits from improved HIV/AIDS treatments.

For Native people, HIV infection is not an isolated challenge—it is one among many, which include housing shortages, unemployment, and teen pregnancy. The effectiveness of HIV/AIDS programs for Native people depends on a close connection with Native cultures. Community-based HIV/AIDS programs that respect indigenous cultures are essential to community acceptance and participation. Where needed, both government and private organizations can help support community efforts by providing training and ongoing technical assistance for HIV/AIDS prevention education efforts. This support is needed to keep the virus from spreading and to deliver services to Native people who are already infected.

Basic: Like other people, it is possible for Native Americans, Alaska Natives, and Native Hawaiians to become infected with HIV (the virus that causes AIDS) if they are exposed to the virus. No one is immune to HIV.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. 8. "HIV/AIDS Among American Indians and Alaskan Natives—1981–1997."
National Native American AIDS Prevention Center. "Contrary to the Press Coverage of CDC's Report on AIDS in Native Americans, the Epidemic is Not Leveling Off in Our Population." Press release. March 18, 1998.
Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

If I have AIDS, whom should I tell?

Basic	Detailed
Basic: It is not easy for people who have HIV (the virus that causes AIDS) to tell others. Sex or needle-sharing partners (past, present, and future) need to know that they are at risk for HIV infection. People with HIV could also tell their doctors, dentists, and dental hygienists.	Detailed: If people have AIDS (a result of HIV infection) or have HIV but have not yet developed AIDS, their sex or needle-sharing partners (past, present, and future) need to know that they are at risk for HIV infection. Partners then can be counseled and tested and can seek immediate medical care if they are infected. Whether or not they have developed AIDS, people who have HIV need to protect their partners from infection and themselves from reinfection. People with HIV, whether or not they have developed AIDS, could also tell their doctors, dentists, and dental hygienists. Health care providers who know that a patient has HIV can monitor the patient's health and offer a range of treatments to prevent, delay, or treat opportunistic infections and to suppress the virus itself, at least for some time. Although there is no cure for HIV infection yet, these treatments can extend life and improve the quality of life for people with HIV. People who have HIV need to have health care providers who know how to care for them. Although employees with HIV are not required by law to tell their employers, some prefer to do it. When employees do disclose that they have HIV or AIDS, they are entitled to the protections of applicable discrimination laws. Also, if employers know about their employees' health concerns, reasonable accommodation (job-related adjustments) becomes possible. It is not easy for people who have HIV to tell others. If people want help to contact sex or needle-sharing partners, they can call their local health departments, clinics for sexually transmitted diseases, or HIV prevention programs. These agencies and programs have trained professionals who can help notify partners without revealing names. Community-based groups offer emotional support and services, and federal, state, and local laws protect people from most forms of discrimination.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Connolly and Marshall. *An Employer's Legal Guide to AIDS in the Workplace.* 9 St. Louis U. Pub. L. Rev. 561, 57 6 (1990).

If I have only vaginal sex, can I get AIDS?

DETAILED: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). If someone has HIV, vaginal sex puts the person's partner at risk for HIV infection. Most people who have become infected through man-woman sex reported having only vaginal sex. A man's semen and a woman's vaginal fluid can spread HIV in the following ways:

- Semen infected with HIV can enter and infect a woman through the vagina.
- Vaginal fluid infected with HIV can enter and infect a man through the penis.
- HIV-infected vaginal fluid can also infect a female partner.

During vaginal sex, HIV can be spread from a man to a woman, a woman to a man, or a woman to a woman. To reduce the risk of infection, partners can use a latex condom the correct way every time they have sex, from start to finish, if either partner is infected or unsure of his or her HIV status. Most of the time, condoms work well and do not break. When they do break, it is usually because of improper use. Condoms are believed to be less likely to break during vaginal sex than during anal sex. Female condoms are also available. Although current research on their effectiveness is encouraging, further research is needed.

BASIC: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). If someone has the virus, vaginal sex puts the person's partner at risk for HIV infection. Some women have gotten the virus from their infected male partners during vaginal sex, and some men have been infected by their female partners during vaginal sex. Partners who have vaginal sex should use a latex condom the right way every time they have sex, from start to finish, if either partner is infected or unsure of his or her HIV status. Though condoms sometimes break, they greatly lower the chances of HIV transmission from one partner to another. Female condoms are also available. Although current research on their effectiveness is encouraging, further research is needed.

Sources: Cotton, D., and Watts, D., eds. *The Medical Management of AIDS in Women.* 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 42, no. 30.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

More Facts About Transmission and Prevention

How can vaginal sex cause AIDS in women?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Even if she has only vaginal sex, a woman can get HIV if her partner is infected. The walls of a woman's vagina are surrounded by blood vessels. An HIV-infected partner's semen or vaginal fluid can enter the woman's body through certain cells in the mucous lining of the vagina or through tiny cuts and tears in the walls of the vagina. Having another sexually transmitted disease (STD) increases the risk of HIV transmission. Using a latex condom the right way every time people have sex greatly reduces the risk of HIV infection. Female condoms are also available. Although current research on their effectiveness is encouraging, further research is needed.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Even if she has only vaginal sex, a woman can get HIV if her partner is infected. The walls of the vagina are surrounded by blood vessels. HIV-infected semen from a male partner or vaginal fluid from a female partner can enter the woman's body through certain cells in the mucous lining of the vagina or through tiny cuts and tears in the walls of the vagina. Having another sexually transmitted disease (STD) such as syphilis, gonorrhea, herpes, or chlamydia increases the risk of HIV transmission.

A woman who has HIV can also infect a partner through vaginal sex. If either the menstrual blood or other vaginal fluid of an HIV-infected woman enters her partner (whether a man through the penis or another woman through the vagina), her partner could become infected.

Using a latex condom the right way every time people have sex greatly reduces the risk of HIV infection. Most of the time, condoms work well. If either partner has HIV, a couple might consider erotic activities that do not involve the exchange of blood, semen, or vaginal fluid.

Female condoms are also available. Although current research on their effectiveness is encouraging, further research is needed.

Sources: Cotton, D., and Watts, D., eds. *The Medical Management of AIDS in Women.* 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 42, no. 30.

If I just fool around, can I get AIDS?

BASIC: Risk of HIV infection depends on what people do. People can become infected with HIV (the virus that causes AIDS) from contact with the blood, semen, or vaginal fluid of a person who has the virus.

DETAILED: Risk of HIV infection depends on what people do. If a sex partner has HIV (the virus that causes AIDS), a person can become infected with the virus from activities that involve contact with the partner's vagina, penis, or anus. Blood, semen, or vaginal fluid from a person with HIV can infect someone else if it enters the person's body.

Using a latex condom the right way every time people have sex greatly reduces the risk of HIV infection. Most of the time, condoms work well. Other choices are polyurethane condoms and female condoms. Research is under way to assess their effectiveness for disease prevention. People cannot get HIV from erotic activities, such as body massages, that do not involve contact with the vagina, penis, or anus.

Sources: Cotton, D., and Watts, D., eds. *The Medical Management of AIDS in Women.* 1997.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can prostitutes spread AIDS?

DETAILED: Yes. AIDS (a result of HIV infection) is caused by a virus. Like anyone else with HIV, infected people who exchange sex for money or drugs such as crack cocaine can infect their partners. Two surgeons general have advised not having sex with men or women who trade sex for money or drugs.

There is ongoing research on injection drug use and condom use among people who exchange sex for money or drugs.

BASIC: Yes. AIDS (a result of HIV infection) is caused by a virus. Like anyone else with HIV, infected people who exchange sex for money or drugs can infect their partners.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
National Research Council. *AIDS, Sexual Behavior, and Intravenous Drug Use.* Turner, C., et al., eds. 1989.

If I pick my sex partner carefully, am I safe?

DETAILED: People cannot tell by looking or asking questions whether or not someone has HIV (the virus that causes AIDS). Many people who have HIV do not know they are infected. It can take years before they develop any symptoms of HIV infection.

Blood, semen, or vaginal fluid from an infected person can spread the virus. People who think that they are at risk of HIV infection are encouraged to seek counseling and testing. Using a latex condom the right way every time people have sex greatly reduces the risk of HIV infection. Condoms are not risk-free—sometimes they break. A couple might consider erotic activities that do not involve the exchange of blood, semen, or vaginal fluid if a partner has HIV or is unsure of his or her HIV status.

BASIC: People cannot tell by looking or asking questions whether or not someone has HIV (the virus that causes AIDS).

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed. 1994.
American Journal of Public Health, 1993; vol. 83, no. 4. "Commentary: Condoms and HIV/STD Prevention—Clarifying the Message." Roper, W.L., et al.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

More Facts About Transmission and Prevention

What is nonoxynol-9?

Basic: Nonoxynol-9 is a chemical that has been shown to kill sperm in laboratory tests. No studies show that nonoxynol-9 or other spermicides add protection against HIV to what a latex condom alone provides.

Detailed: Nonoxynol-9 is a chemical often used in spermicides. This chemical is used in contraceptive foams, creams, and jellies to prevent pregnancy. In laboratory tests, nonoxynol-9 has been shown to kill HIV as well as other sexually transmitted germs.

There are no data, however, to show that condoms lubricated with spermicide are more effective than other lubricated condoms in protecting against HIV and other sexually transmitted germs. Furthermore, no studies have shown that nonoxynol-9 used with a condom adds to the protection against HIV provided by a latex condom alone. The Centers for Disease Control and Prevention (CDC) recommends the correct and consistent use of latex condoms with or without spermicide. CDC does not recommend the use of a spermicide by itself to prevent HIV infection.

Sources: Centers for Disease Control and Prevention. "What We Know About Nonoxynol-9 for HIV and STD Prevention." Update. April 1997.
National Institute of Allergy and Infectious Diseases."NIAID Evaluates N-9 as Microbicide." News release. April 3, 1997.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 42, no. 30.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

What does parenteral transmission of AIDS mean?

Basic: AIDS (a result of HIV infection) is caused by a virus (HIV). *Parenteral transmission* of HIV refers to the spread of HIV through the use of HIV-contaminated needles and syringes.

Detailed: AIDS (a result of HIV infection) is caused by a virus (HIV). *Parenteral transmission* refers to the spread of HIV through the use of HIV-contaminated needles and syringes. The term is used to refer both to infection from needle sharing by people who inject drugs and to the rare infection of health care workers from needle jabs in the workplace.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
HIV/AIDS Treatment Information Service. *Glossary of HIV/AIDS-Related Terms,* 2nd ed. March 1997.

My teammates and I share needles only to take steroids. Can we get AIDS? I share needles only with my friends. Can I get AIDS?

Detailed: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). If someone's friends or teammates have HIV, he or she can become infected through sharing needles and syringes with them. Sharing contaminated equipment puts a person at risk for HIV infection, because any blood left in the needle or syringe is injected directly into the body of the next person who uses it. People cannot tell just by looking whether someone has HIV. Someone who has HIV can look and feel fine but can still infect others through sharing needles and syringes and having sex with them.

Basic: Yes. AIDS (a result of HIV infection) is caused by a virus (HIV). If a person shares needles and syringes with friends or teammates who have HIV, he or she can become infected. People cannot tell by the way someone looks whether he or she has HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

I never share needles. Is it true I cannot get AIDS?

Detailed: Even if people never share needles and syringes, they can get HIV (the virus that causes AIDS) by having sex with partners who have HIV. Remember, HIV is spread through sexual as well as blood-to-blood contact. By never sharing needles and syringes, people can at least protect themselves from getting HIV this way. Because drugs affect judgment, however, their use may lead people to have sex without using latex condoms.

Basic: HIV (the virus that causes AIDS) can be spread in other ways besides sharing needles and syringes. For example, someone can get the virus from having sex with a person who has HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

More Facts About Transmission and Prevention

How big a problem is AIDS among IV drug users in the United States?

Basic: As of December 1997, 161,872 adults and teenagers who injected drugs had HIV and had developed AIDS (a result of HIV infection). In some places, such as New York City, 50 to 60 percent of people who inject drugs have HIV.

Detailed: Estimates of the number of people in the United States who take drugs by injection range from 1.1 million to 1.9 million. As of December 1997, 161,872 adults and teenagers who injected drugs had HIV and had developed AIDS (a result of HIV infection).

The incidence of HIV infection among people who inject drugs varies by area. By studying drug-injecting people in drug treatment programs, scientists have found that drug injectors in New York City, Puerto Rico, and northern New Jersey have the highest levels of HIV infection (50 to 60 percent). In most other areas of the country, people who inject drugs have much lower rates of infection (10 percent or less). But HIV can spread very quickly within a network of people who inject drugs. In New York City, for example, a study of liver disease followed a group of injection drug users for a number of years. Reexamining the blood samples, scientists discovered that although none of the injection drug users tested positive for HIV antibodies in 1978, 56 percent did by 1984.

Other research in New York City in 1990 showed that more than 80 percent of the AIDS cases from sex between men and women involved a man who injected drugs and a woman partner who did not. More than three-fourths of the children with AIDS in New York have parents who inject drugs. However, many people who inject drugs are now taking precautions to protect themselves and others from HIV.

In 1993 and again in 1997, the Centers for Disease Control and Prevention (CDC) and other government agencies issued statements about the role of chlorine bleach in reducing the risk of HIV transmission among people who inject drugs. The statements expressed the need to expand efforts to help people stop injecting drugs. The statements also included a call to review laws regulating the availability of needles and syringes and recommendations for cleaning drug equipment more effectively.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. "Medical Advice for Persons Who Inject Illicit Drugs." *HIV Prevention Bulletin.* May 9, 1997.

National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.

Centers for Disease Control and Prevention, National Institute on Drug Abuse, and Center for Substance Abuse Treatment. *HIV/AIDS Prevention Bulletin.* April 19, 1993.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed. 1992.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

For local referrals to treatment and counseling for substance use, contact the National Substance Abuse Hotline (800/262-2463); referrals in Spanish available. For information on substance use, contact the National Clearinghouse for Alcohol and Drug Information (NCADI) (800/729-6686) or its Website at www.health.org. For information on drug dependency, contact the National Council on Alcoholism and Drug Dependence (800/622-2255) or its Website at www.ncadd.org.

Why is smoking crack associated with AIDS?

DETAILED: Crack is a form of cocaine that usually is smoked. Crack smokers are at risk for HIV infection in at least two ways:

1. They may have sex with people at risk for having HIV.
2. They may switch from smoking crack to injecting drugs.

Crack creates a short-lived high and a strong addiction. People buy and use crack at crack houses and crack spots. Sex is common at these places, because—

- Some crack smokers exchange sex for crack.
- Some crack smokers use sex to make money to buy crack.
- Some crack smokers engage in sex while using crack to increase the high (a "double master blaster").
- Crack seems to increase the desire to engage in sex.

In addition, condom use at crack spots is uncommon. In such settings, people who insist on using condoms may not be successful in convincing their sex partners to do so. Also, people who want to buy drugs by offering sex may not be successful if they insist on condom use.

Many women who use crack and exchange sex for money or crack may eventually inject drugs such as heroin. Injection drug use can put women at a greater risk of getting HIV if they share needles and syringes with people who have the virus.

BASIC: Crack is a form of cocaine that usually is smoked rather than injected. Even so, people who smoke crack risk HIV infection because of activities associated with "crack culture."

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
National Research Council. *AIDS, Sexual Behavior, and Intravenous Drug Use.* Turner, C., et al., eds. 1989.
Narcotics and Drug Research, Inc. *Crack Puts Women at Risk for Heterosexual Transmission of HIV.* Williams, T., et al. No date.

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Are people who use cocaine at risk of getting AIDS?

BASIC: Yes, but their risk depends on the way they use cocaine and the activities they engage in as a result of cocaine use.

DETAILED: Yes, but their risk depends on the way they use cocaine and the activities they engage in because of cocaine. Cocaine itself cannot spread HIV (the virus that causes AIDS), and *snorting* cocaine does not put a person at direct risk of HIV infection. Like other drugs, however, cocaine affects people's judgment and may lead them to take risks they would not otherwise consider, such as having sex without using a latex condom. *Smoking* a form of cocaine known as crack makes risky sexual behavior even more likely, because crack increases the sex drive. *Injecting* cocaine greatly increases the direct risk of HIV infection if needles are shared.

Anyone who uses an HIV-contaminated needle and syringe to inject drugs, regardless of the drug, can get HIV because the virus can enter the body directly. The characteristics of cocaine addiction compound this risk:

- A study of people who inject cocaine in San Francisco showed that injecting cocaine may be linked to "booting," a method used to get any drug remaining in the syringe by flushing it out with blood.
- People who use cocaine tend to inject more frequently than people who use heroin because cocaine causes a shorter high.
- Scientists have found that the frequency of injection is directly related to the risk of HIV infection.
- Large-scale treatment programs for cocaine use do not exist.
- Methadone treatment for heroin addiction does little for cocaine addiction.
- Many people who use drugs may actually start or increase cocaine use while being treated for heroin use. If people share needles and syringes, they risk HIV infection.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992.
National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.
National Research Council. *AIDS, Sexual Behavior, and Intravenous Drug Use.* Turner, C., et al., eds. 1989.
National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

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Are drug users changing their behavior?

Detailed: Yes, studies indicate that some people who inject drugs are learning about HIV infection and taking precautions. As early as 1985, several studies found that nearly all of the injection drug users interviewed knew that HIV transmission could occur through needle sharing. About half were taking steps to protect themselves. A five-year demonstration research project in Chicago reported a dramatic decrease in needle sharing among people who injected drugs, dropping from 95 percent to 15 percent.

Several obstacles confront drug users who wish to change their behavior:

- Openings in treatment facilities for heroin addiction are limited. People must often wait months before being accepted into such programs.
- No large-scale treatment program exists for cocaine or crack addiction.
- Clean needles and syringes are scarce, and it is illegal to possess them without a prescription in many areas of the country.

Prevention efforts have not eliminated the risk of HIV infection for those who inject drugs. More efforts are needed. But the fact that many people who use drugs are taking some protective measures provides hope that drug users will further reduce their risk of HIV infection through more education and better prevention resources.

Research shows that many kinds of programs help reduce the spread of HIV. For example, many communities have started needle exchanges, as well as outreach and expanded drug treatment programs, to help people who inject drugs protect themselves and others from HIV. Researchers have found that providing injection drug users with safer injection alternatives does not increase drug use or reduce demand for drug treatment. Needle exchanges in many cities, including Amsterdam, Tacoma (Washington), and San Francisco, have resulted in reduced rates of new HIV infection.

Basic: Yes, some people who use drugs are starting to change their behavior. Some studies show that some people who inject drugs are taking steps to protect themselves and others. As with other people, more extensive behavior change is still needed.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992.

National Research Council and Institute of Medicine. *Preventing HIV Transmission: The Role of Sterile Needles and Bleach.* Normand, J., et al., eds. 1995.

Lurie, P., and Reingold, A. *The Public Health Impact of Needle-Exchange Programs in the United States and Abroad: Summary, Conclusions, and Recommendations.* University of California at Berkeley, School of Public Health, and University of California at San Francisco, Institute for Health Policy Studies. 1993.

National Research Council. *AIDS, Sexual Behavior, and Intravenous Drug Use.* Turner, C., et al., eds. 1989.

National Institute on Drug Abuse. "Needle Sharing Among Intravenous Drug Abusers: National and International Perspectives." *Research Monograph 80.* Battjes, R., and Pickens, R., eds. 1988.

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More Facts About Transmission and Prevention

Can I get AIDS from a friend or co-worker who looks sick?
Can I get AIDS from a co-worker whose lifestyle I disapprove of?

BASIC: No. AIDS (a result of HIV infection) is caused by a virus (HIV). A friend or co-worker with HIV cannot infect anyone through casual everyday contact. Someone who looks sick does not necessarily have HIV.

DETAILED: No. AIDS (a result of HIV infection) is caused by a virus (HIV). Just because others disapprove of someone's lifestyle or suspect that he or she may take risks related to HIV does not prove that the person has HIV. If someone does have the virus, however, other people cannot become infected through casual everyday contact. As of December 1997, 641,086 people had developed AIDS. None of them got HIV through casual contact. In addition, after studying hundreds of family members and friends of people with HIV, scientists know that people cannot get the virus from just being around someone with HIV. For instance, people can share office space, phones, bathrooms, handshakes, and utensils—even kisses on the cheek—with a person who has HIV and not become infected. HIV spreads through blood-to-blood contact and sex with someone who has the virus.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

If you cannot get AIDS through casual contact, why do some police officers and firefighters wear gloves when dealing with people who might have AIDS?

Detailed: Police officers, firefighters, and emergency personnel have a duty to respond to situations in which people may be injured. It is the likely exposure to blood and other body fluids on the job, not casual contact with people who need help, that requires the use of gloves and other barrier equipment. First responders and health care workers face many challenges during emergency situations:

- It is impossible to tell whether an injured person has HIV (the virus that causes AIDS), and many people do not know that they are infected.
- In emergency situations, if a person is infected, it is impossible to tell which body fluids contain HIV and which do not. Any fluid that contains blood is potentially infectious, but first responders do not have time to figure out which fluids have visible blood and which do not.
- First responders and health care workers must also reduce their risk from bloodborne germs other than HIV, most notably, hepatitis B and C. These viruses spread more easily than HIV because blood contains much greater quantities of them.

In 1992, the Occupational Safety and Health Administration (OSHA) issued regulations for workplaces where "reasonable anticipation of exposure to blood" exists. These regulations help protect emergency workers as well as others from bloodborne germs such as HIV and hepatitis B. Protective measures for first responders include—

- Placing barriers between themselves and all body fluids of the people they help whenever possible.
- Using gloves, masks, and goggles as necessary.
- Taking these precautions with every person they help.

These precautions also protect the people who first responders help.

Basic: Police officers, firefighters, and emergency personnel routinely wear gloves when responding to calls because first responders often are exposed to blood and other body fluids. When these fluids contain blood, they can be infectious if the people being helped have HIV (the virus that causes AIDS), hepatitis B or other hepatitis viruses, or other bloodborne germs.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed., 1997; 3rd ed., 1992.
U.S. Department of Labor, Occupational Safety and Health Administration. *Occupational Exposure to Bloodborne Pathogens, Final Rule.* 29 CFR Part 1910.1030. December 6, 1991.
Centers for Disease Control and Prevention. *MMWR,* 1989; vol. 38, no. S-6. "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers."

For information on occupational exposure to HIV and other bloodborne germs, contact the National Clinician's Post-Exposure Prophylaxis Hotline (PEPLine) at San Francisco General Hospital (888/448-4911).

4 More Facts About Testing

How do you test for AIDS?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). The standard test for HIV today—

- Analyzes samples of blood or fluid from the mouth.
- Detects antibodies to HIV, not the virus itself.

Antibodies are substances the body makes to defend itself when it is invaded by germs such as HIV. People who have antibodies to HIV have been infected with HIV.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). The standard test today does not test for the actual virus; instead, the test checks for antibodies to HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997; 3rd ed., 1992.
Journal of the American Medical Association, 1997; vol. 277, no. 3. "Evaluation of a System Using Oral Mucosal Transudate for HIV-1 Antibody Screening and Confirmatory Testing." Gallo, D., et al.

How good are the antibody tests?

DETAILED: The standard tests that detect HIV antibodies are very good. A sample of blood or fluid from the mouth is screened for antibodies to HIV using the EIA (enzyme immunoassay, formerly called the ELISA). If the EIA detects HIV antibodies, the sample is tested again using another EIA. If the second EIA shows the same result, the sample is tested a third time using a confirmatory test. This test is usually either a Western blot or an IFA (indirect immunofluorescence assay). A sample is considered to be HIV-infected when an EIA showing the presence of HIV antibodies is repeated, with the same results, and then confirmed as positive by a Western blot or IFA. This testing method increases the accuracy of detecting HIV infection to almost 100 percent.

BASIC: The standard tests that detect HIV antibodies are very good. The combination of the EIA (enzyme immunoassay, formerly called the ELISA), the standard screening test, followed by the Western blot or IFA (confirmatory tests) is able to detect signs of HIV infection in almost 100 percent of HIV-positive blood or fluid from the mouth.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Journal of the American Medical Association, 1997; vol. 277, no. 3. "Evaluation of a System Using Oral Mucosal Transudate for HIV-1 Antibody Screening and Confirmatory Testing." Gallo, D., et al.

Why do people receive counseling before and after testing?

BASIC: One goal of testing for HIV (the virus that causes AIDS) is to encourage prevention behavior in people who are tested. Counseling focuses on how people can protect themselves and others from becoming infected. People need this counseling both before and after testing so that even if they decide not to be tested or not to return for their test results, they will still have some information on how to change their behavior. Another goal of testing is to encourage people whose tests detect HIV to seek medical care.

DETAILED: One goal of testing for HIV (the virus that causes AIDS) is to encourage prevention behavior in people who are tested. Counseling covers issues such as personal risk assessment, barriers to prevention behavior, and plans for risk reduction. Without counseling, people may not know how to change their behavior to keep from becoming infected or from infecting others. With pretest counseling, even people who decide not to be tested or not to return for their results still have information that can help them change their behavior to protect themselves and others.

Another goal of testing is to help people cope with the emotional impact of their test results and offer them options if the result is positive (shows that HIV is present). In many respects, HIV infection has become a treatable condition. Doctors can now monitor the health of people with HIV and provide them with a range of treatments to suppress the virus itself and to prevent, delay, or treat opportunistic infections. These treatments extend life and improve the quality of life for people with HIV.

It is important for people to receive counseling both before and after testing so that they understand the meaning of their test results, the resources available to them, and the ways they can protect themselves and others.

Sources: Centers for Disease Control and Prevention. *MMWR*, 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *HIV Counseling, Testing and Referral: Standards and Guidelines.* May 1994.

Are there other tests available?

Detailed: The EIA (enzyme immunoassay, formerly called ELISA) is the standard screening test used to detect the presence of HIV (the virus that causes AIDS). The EIA should be used with a confirmatory test such as the Western blot. Tests that detect other signs of HIV are available for special purposes, such as for additional testing of the blood supply and conducting research. Because some tests are expensive or require sophisticated equipment and specialized training, their use is limited. In addition to the EIA, other tests now available include—

- **Radioimmunoprecipitation assay (RIPA).** A confirmatory blood test that may be used when antibody levels are very low or difficult to detect or when Western blot test results are uncertain. An expensive test, the RIPA requires time and expertise to perform.
- **Rapid latex agglutination assay.** A simplified, inexpensive blood test that may prove useful in medically disadvantaged areas where there is a high incidence of HIV infection.
- **Dot-blot immunobinding assay.** A rapid-screening blood test that is cost-effective and that may become an alternative to conventional EIA and Western blot testing.
- **p24 antigen capture assay.** Also known as the HIV-1 antigen capture assay. This blood test was added as an interim measure by the Food and Drug Administration (FDA) in 1996 to HIV-antibody testing to protect the blood supply further until other tests become available to shorten the "window period." Because some activity of p24 antigen is unpredictable, this test is not useful for helping people find out if they have HIV.
- **Genome amplification technology (GAT).** Specialized blood tests that look for HIV genetic information. Although expensive and labor-intensive, these tests can detect the virus even in someone only recently infected. To further protect the blood supply, the FDA has indicated that the development and implementation of GAT, such as PCR and TMA, is warranted.
- **New rapid HIV tests.** Tests, which produce results in 5 to 30 minutes, available at some testing sites. Like the EIA, the rapid HIV test detects antibodies to HIV. Although the rapid HIV test is as accurate as the EIA, results showing the presence of HIV need to be confirmed by other tests, which usually take one or two weeks.

Basic: The EIA (enzyme immunoassay, formerly called ELISA) is the standard screening test used to detect the presence of HIV (the virus that causes AIDS). The EIA should be used with a confirmatory test. Tests that detect other signs of HIV are available for special purposes, such as for additional testing of the blood supply and conducting research. Some of these tests are expensive or require sophisticated equipment and specialized training.

Sources: Centers for Disease Control and Prevention. "Rapid HIV Tests: Questions/Answers." March 1998.
American Red Cross Biomedical Services. *Manufacts,* Winter 1998. "Pilot Evaluation of Genome Amplification Techniques for Testing Pooled Voluntary Donor Samples." Stramer, S.L.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *CDC National AIDS Hotline Training Bulletin,* March 20, 1996; no. 173.

If there's an AIDS test that uses saliva, does this mean you can get AIDS from someone's saliva?

BASIC: No. The oral (saliva) test uses a sample of fluid from the mouth to look for antibodies to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"), not the virus itself. Although there is a theoretical possibility that saliva could spread HIV, this is highly unlikely. According to the Centers for Disease Control and Prevention (CDC), there are no documented cases of HIV spread through saliva.

DETAILED: No. The oral or saliva test (a type of EIA—enzyme immunoassay) uses a sample of fluid from the mouth to look for antibodies to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"), not for the virus itself. Although there is a theoretical possibility that saliva could spread HIV, this is highly unlikely. According to the Centers for Disease Control and Prevention (CDC), there are no documented cases of HIV spread through saliva.

Studies of the antibody test using fluids from the mouth have shown it to be an accurate alternative to blood-based antibody tests. Oral tests have been approved in the United States for use by doctors but not for home use. Because the tests do not require the skilled technicians nor the refrigeration needed for blood-based tests, they may dramatically improve HIV-testing capacity in isolated settings and under a variety of conditions and lower the cost of testing.

Sources: *Journal of the American Medical Association,* 1997; vol. 277, no. 3. "Evaluation of a System Using Oral Mucosal Transudate for HIV-1 Antibody Screening and Confirmatory Testing." Gallo, D., et al.

Centers for Disease Control and Prevention. "OraSure* Oral HIV-1 Antibody Tests." Questions and Answers. June 3, 1996.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed., 1992.

If there's an AIDS test that uses urine, does this mean you can get AIDS from someone's urine?

DETAILED: No. The urine-based EIA (enzyme immunoassay) looks for antibodies to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"), not the virus itself. It is highly unlikely that the urine of a person with HIV could spread HIV, unless the urine contains visible blood. There are no documented cases of HIV spread through urine.

The Food and Drug Administration (FDA) found the urine test to be "sufficiently accurate" for HIV screening in medical and public health settings, approving the test for use by doctors (in situations where blood-based tests are impractical), but not for home use. A blood test should be used to confirm a urine test showing the presence of HIV antibodies.

BASIC: No. The urine test looks for antibodies to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"), not the virus itself. It is highly unlikely that the urine of a person with HIV could spread HIV, unless the urine contains visible blood. There are no documented cases of HIV spread through urine.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Food and Drug Administration. "FDA Approves First Urine-Based HIV Test." Talk Paper T96 55. August 6, 1996.
Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed., 1994.

My AIDS test is positive. Does that mean I'm going to die?

BASIC: Positive test results, which show the presence of HIV, confirmed by either a Western blot or immunofluorescence assay (IFA), mean that a person—

- Has HIV.
- Will always have HIV.
- Can spread HIV to others.

A positive test result does not mean that a person—

- Has already developed AIDS (a result of HIV infection).
- Will necessarily develop AIDS.
- Will necessarily die of AIDS.

DETAILED: Positive test results, which show the presence of HIV, confirmed by either a Western blot or immunofluorescence assay (IFA), mean that a person—

- Has HIV.
- Will always be infected with HIV.
- Can spread HIV to others.

A positive test result does not mean that a person—

- Has already developed AIDS (a result of HIV infection).
- Will necessarily develop AIDS.
- Will necessarily die of AIDS.

Of the people with HIV, about half develop AIDS within 10 years after becoming infected. Within 12 years after infection, 65 percent develop AIDS, and 35 percent remain at high risk for AIDS. However, powerful new combination therapy, including protease inhibitors, has been shown to slow the pace of HIV infection, extending life and improving the quality of life for many people with HIV.

Getting treatment early and maintaining a healthy lifestyle can help people who have HIV stay well. Even better treatments may be available in the future. In the meantime, scientists emphasize that even people who are responding well to combination therapy should be considered able to infect others with HIV and should be encouraged to adopt and maintain prevention behavior.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

What is a false positive?

DETAILED: For an EIA (enzyme immmunoassay, formerly called ELISA), a false positive is a test result that appears to indicate the presence of HIV antibodies in blood or fluid from the mouth that contains no HIV (the virus that causes AIDS). False positives are uncommon because the antibody tests used are very accurate. To minimize the possibility of false positive test results, the Centers for Disease Control and Prevention (CDC) has stated that a sample should be considered positive only if two separate EIAs show the presence of HIV antibodies and a Western blot or IFA confirms these results. When the EIA and Western blot or IFA are used in sequence, they are nearly 100 percent accurate.

BASIC: For an EIA (enzyme immunoassay, formerly called ELISA), a false positive is a test result that appears to indicate the presence of HIV antibodies in a sample of blood or fluid from the mouth that contains no HIV (the virus that causes AIDS). To help prevent false positives, the Centers for Disease Control and Prevention (CDC) has stated that a sample should be considered positive only if two separate EIAs indicate the presence of HIV antibodies and a Western blot or IFA confirms these results.

Sources: Centers for Disease Control and Prevention. "Accuracy of Tests." Questions and Answers. Available at http://www.cdcnac.org/ques02.html (visited January 12, 1998).

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

New England Journal of Medicine, 1988; vol. 319, no. 15. "Measurement of the False Positive Rate in a Screening Program for Human Immunodeficiency Virus Infections." Burke, D., et al.

Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 2S.

If I test negative for HIV, does this mean I am safe from getting AIDS?

BASIC: No. AIDS (a result of HIV infection) is caused by a virus (HIV). A negative EIA (enzyme immunoassay) result does not mean that a person cannot get the virus in the future. It means only that the person shows no signs of having been infected with HIV in the past; that is, the test did not detect HIV antibodies. If people have sex, using a latex condom the right way every time greatly reduces the risk of HIV infection.

DETAILED: No. AIDS (a result of HIV infection) is caused by a virus (HIV). A negative EIA (enzyme immunoassay) result does not mean that a person cannot get the virus in the future. It means only that HIV antibodies were not detected by the test. However, if someone has been recently infected with HIV and is tested before developing a detectable level of antibodies, he or she may still test negative—even though he or she is infected.

To keep from becoming infected, people can refrain from having sex or sharing needles and syringes with anyone who has HIV. (It's hard to know for sure whether or not someone has HIV.) If people have sex, using a latex condom the right way every time greatly reduces the risk of HIV infection. If people inject drugs or other substances, not sharing needles and syringes helps protect them from HIV.

Sources: Centers for Disease Control and Prevention. "Accuracy of Tests." Questions and Answers. Available at http://www.cdcnac.org/ques02.html (visited January 12, 1998).
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *CDC National AIDS Hotline Training Bulletin,* May 5, 1993; no. 48.

What is a false negative?
When would a false negative occur?

DETAILED: A false negative EIA (enzyme immunoassay) means that a sample of blood or fluid from the mouth tested negative for HIV (the virus that causes AIDS), even though the sample contained the virus. The EIA is the standard test used to screen for HIV, and it looks for antibodies to HIV, not the virus itself. Because antibodies in recently infected people may not yet be detectable, antibody test results might be negative—even though the people are infected. The antibody tests are very accurate (they can find signs of HIV infection in almost 100 percent of the infected people tested), but they may miss an infected blood sample once in a while. Also, false negative results might occur if tests are handled improperly. Scientists have improved the EIA since it was developed, and the most cautious estimate for false negative results from the test is very low. Tests that can detect the virus itself may help further reduce false negative results. For now, however, such tests are not widely available outside specialized settings.

BASIC: A false negative EIA (enzyme immunoassay) means that a sample of blood or fluid from the mouth tested negative for HIV (the virus that causes AIDS), even though the sample contained the virus. This kind of test result might happen if a person is tested soon after becoming infected (before the immune system has produced a detectable level of antibodies) or if tests are handled improperly.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 2S.

My AIDS test was negative. Do I have to be retested?

BASIC: If people test negative for antibodies to HIV (the virus that causes AIDS), they probably do not have the virus. However, if they continue to take risks related to HIV, they may want to be retested after waiting an adequate time to allow detectable antibodies to develop. Usually, this happens within three months; the average time is 25 days.

DETAILED: If people test negative for antibodies to HIV (the virus that causes AIDS), they probably do not have the virus. People may want to be retested if—

- They continue to take risks (having sex or sharing needles and syringes with someone who may have HIV) after being tested. (They can retest after waiting an adequate time to allow detectable antibodies to develop. Usually, this happens within three months; the average time is 25 days.)
- They have symptoms related to HIV infection. (They can see their doctors about retesting and other health matters.)

If people do not have HIV, they can take steps to help protect themselves in the future by not having sex without using a condom and by not sharing needles and syringes with anyone who has HIV. (It's hard to know for sure whether or not someone has HIV.)

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. 22. "Update: Provisional Public Health Service Recommendations for Chemoprophylaxis After Occupational Exposure to HIV."

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

5 More Facts About Blood Supply and Related Issues

Does freezing blood kill HIV?
Can blood be stored for a while to kill HIV?

DETAILED: Neither freezing nor storing blood seems to kill HIV (the virus that causes AIDS). HIV can survive freezing. Scientists know that before the start of testing (in 1985) and the introduction of viral inactivation processes, products made from frozen plasma could transmit HIV. The risk of HIV infection from frozen red cells, however, may be lower than the risk from whole blood. When red blood cells are frozen, they are treated in ways that likely reduce the number of infectious viruses in the red cell product.

Although some early studies suggested that storing blood could sometimes reduce the number of infectious viruses, newer research shows that this cannot be relied on as a safety measure. Some research by the Food and Drug Administration (FDA) suggests that HIV can survive for some time in the presence of red blood cells. Researchers who study blood are looking for ways to inactivate virus within certain cells, without damaging the cells themselves.

BASIC: Freezing blood does not kill HIV (the virus that causes AIDS). Storing blood probably does not kill the virus either.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Blood, 1993; vol. 82 (suppl. 1). "New Photosensitizers to Inactivate Viruses in Red Blood Cells." Rywkin, S., et al.
Blood, 1993; vol. 82 (suppl. 1). "Quencher Mediated Protection of Platelet Integrity During Psoralen Photoinactivation of Viruses in Platelet Concentrates." Margolis-Nunno, H., et al.
Annals of Internal Medicine, 1990; vol. 113. "Infection With Human Immunodeficiency Virus Type 1 (HIV-1) Among Recipients of Antibody-Positive Blood Donations." Donegan, E., et al.
Transfusion, 1990; vol. 30, no. 9. "Transmission of HIV-1 by Component Type and Duration of Shelf Storage Before Transfusion." Donegan, E., et al.

Do antibodies to HIV continue to develop in blood even after it is collected?

BASIC: No.

DETAILED: No. Living cells in the body make antibodies. After being collected in a blood bag, the cells in donated blood slow down or stop their normal work because the blood is stored at temperatures below normal body temperature. Production of antibodies would be minimal after collection; therefore, waiting to test blood would not enhance the safety or improve the test results of stored blood.

Sources: *Annals of Internal Medicine,* 1990; vol. 113, no. 10. "Infection With Human Immunodeficiency Virus Type 1 (HIV-1) Among Recipients of Antibody-Positive Blood Donations." Donegan, E., et al.
Transfusion, 1990; vol. 30, no. 9. "Transmission of HIV-1 by Component Type and Duration of Shelf Storage Before Transfusion." Donegan, E., et al.

What are my chances of becoming infected from a transfusion?

BASIC: Extremely small. The risk of receiving an HIV-infected blood transfusion is estimated to be 1 in 676,000.

DETAILED: The chances of becoming infected from a transfusion are extremely small. First of all, every donor is interviewed for risks of HIV infection. In addition—

- Since 1985, all donated blood has been tested for signs of HIV.
- Testing methods have greatly improved.
- Donated blood is destroyed if tests detect signs of HIV.
- Very few infected blood donations go undetected.

This means that the risk of receiving an infected transfusion is minimal, estimated to be 1 in 676,000.

As of December 1997, 641,086 people in the United States had developed AIDS. Of these people, only 37 adults or teenagers and 2 children had developed AIDS after receiving blood that had been screened for signs of HIV.

People need not refuse a transfusion out of fear of becoming infected with HIV, because the risk of receiving an HIV-infected unit of blood is extremely low.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Transfusion, 1997; vol. 37. "Cost-Effectiveness of Expanded Human Immunodeficiency Virus Testing Protocols for Donated Blood." AuBuchon, J., et al.
Centers for Disease Control and Prevention. *MMWR,* 1996; vol. 45, no. RR-2. "U.S. Public Health Service Guidelines for Testing and Counseling Blood and Plasma Donors for Human Immunodeficiency Virus Type 1 Antigen."

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

Isn't there a new AIDS virus?
Is the blood supply still safe?

DETAILED: There is a virus, called HIV-2, that is closely related to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"). Because HIV-2 is so uncommon in the United States, most people refer to HIV-1 as simply HIV. From the first case of HIV-2 in 1987 through December 1997, only 77 cases of AIDS caused by HIV-2 had been found in the nation. Since June 1992, the Food and Drug Administration (FDA) has required that all blood centers test all donated blood for both HIV-1 and HIV-2 antibodies (in addition to running other tests that can detect signs of HIV). Most cases of AIDS caused by HIV-2 have been found in West Africa.

Having identified several different groups of HIV-1, scientists have learned that the virus is a "family" of closely related members. Although there are some differences in genetic make-up between the groups, they are so similar that all are recognized as HIV (or more precisely, HIV-1). However, one of these groups, known as HIV-1 group O, cannot reliably be detected by current tests. As an interim measure to protect the blood supply, the FDA states that blood banks must ask potential donors questions to defer people who are at risk for this virus, until tests are available that also can detect HIV-1 group O.

The risk of becoming infected from a blood transfusion is extremely low, estimated to be 1 in 676,000.

BASIC: There is a virus, called HIV-2, that is closely related to HIV-1 (usually referred to as "HIV, the virus that causes AIDS"). Cases of HIV-2 infection are rare in the United States. Since June 1992, blood centers have tested all donated blood for both HIV-1 and HIV-2 antibodies, in addition to running other tests that can detect signs of HIV. One group of HIV-1, known as HIV-1 group O, is not reliably detected by current tests. The Food and Drug Administration (FDA) states that until tests are available that can also detect this kind of HIV-1, blood banks need to defer people who may be at risk of HIV-1 group O to protect the blood supply. The risk of becoming infected with HIV from a blood transfusion is extremely low.

Sources:
Centers for Disease Control and Prevention. "Human Immunodeficiency Virus Type 2." April 1998.
American Association of Blood Banks. "Donor Questions on HIV-1 Group O Infection and Creutzfeldt-Jakob Disease." Association Bulletin 97-5. August 1, 1997.
Transfusion 1997; vol. 37. "Cost-Effectiveness of Expanded Human Immunodeficiency Virus Testing Protocols for Donated Blood." AuBuchon, J., et al.
Centers for Disease Control and Prevention. *MMWR*, 1996; vol. 45, no. 26. "Identification of HIV-1 Group O Infection—Los Angeles County, California, 1996."
Food and Drug Administration. "Interim Recommendations for Deferral of Donors at Increased Risk for HIV-1 Group O Infection." Memorandum. December 11, 1996.
Journal of the American Medical Association, 1996; vol. 275, no. 3. "The Emerging Genetic Diversity of HIV: The Importance of Global Surveillance for Diagnostics, Research, and Prevention." Hu, D.J., et al.
AIDS, 1994; vol. 8 (suppl. 1). "Epidemiology and Natural History of HIV-2." Kanki, P.J., and De Cock, K.M.

More Facts About Blood Supply and Related Issues

What happens to donated blood that is infected?

BASIC: When Red Cross and other blood banks find donated blood that contains HIV (the virus that causes AIDS), they destroy it.

DETAILED: Red Cross and other blood banks test every donor's blood for signs of HIV (the virus that causes AIDS). Any blood that shows the presence of HIV is destroyed according to local environmental safety and infection control measures. Usually, the blood is heated to a very high temperature under great pressure to sterilize it before being destroyed. This process is called autoclaving.

Sources: American Red Cross. "Giving and Receiving Blood." Fact sheet. June 1996.
Food and Drug Administration. *Revised Recommendations for the Prevention of Human Immunodeficiency Virus (HIV) Transmission by Blood and Blood Products.* April 23, 1992.
American Red Cross. *Blood Services Directive 6.52.* 1988.

Would someone who got an infected transfusion get AIDS?

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Someone who receives an HIV-infected transfusion would probably become infected with HIV and would probably develop AIDS. Since testing began in 1985, however, it is rare for anyone to receive an HIV-infected transfusion.

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Someone who receives an HIV-infected transfusion would likely become infected with HIV. Researchers have found that up to 100 percent of the people who received blood that contained HIV became infected. Since testing the blood supply for signs of HIV began in 1985, it is rare for anyone to receive an HIV-infected transfusion. Also, methods of testing have improved.

Many people who have HIV will develop AIDS; however, powerful new combination therapy, including protease inhibitors, have been shown to slow the pace of infection in many people with HIV. These treatments extend life and improve the quality of life for many people with HIV.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-5. "Report of the NIH Panel to Define Principles of Therapy of HIV Infection."
Transfusion, 1990; vol. 30, no. 9. "Transmission of HIV-1 by Component Type and Duration of Shelf Storage Before Transfusion." Donegan, E., et al.
National Academy of Sciences. *Confronting AIDS: Update 1988.* 1988.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What are "look-back programs" for people who have had blood transfusions?

DETAILED: "Look-back programs" for people who have had blood transfusions are tools used to minimize the spread of HIV infection through blood transfusions later found to be HIV-infected. Usually, such programs identify donors and recipients linked by transfused blood, explain the risk of HIV transmission to them, and offer testing. Some programs notify people who received blood transfusions from donors who later tested positive for signs of HIV. Other programs look for specific donors, after people who received transfusions of donated blood later test positive for signs of HIV. Still other programs notify groups of transfusion recipients. For example, several San Francisco hospitals contacted people who received transfusions before testing became available, to notify them of their risk and to offer testing.

BASIC: "Look-back programs" for people who have had blood transfusions are tools used to minimize the spread of HIV infection through blood transfusions later found to be HIV-infected. Usually, such programs identify donors and recipients linked by transfused blood, explain the risk of HIV transmission to them, and offer testing.

Sources: Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed., 1994.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 3rd ed., 1992; 2nd ed., 1988.
Food and Drug Administration. *Revised Recommendations for the Prevention of Human Immunodeficiency Virus (HIV) Transmission by Blood and Blood Products.* April 23, 1992.

Will I be told about the test results on the blood I donate?

BASIC: People are told about the results of tests done on their blood donations if the tests show signs of HIV (the virus that causes AIDS) or if the test results are ambiguous (unconfirmed). The same is true for results of tests for certain other germs. The Red Cross and other blood banks test blood to safeguard the blood supply, not to provide a testing service for people who want to know their HIV status. People should not donate blood in order to find out whether they have HIV. Instead, they should call their local Red Cross or health department to find out where testing is available.

DETAILED: People are told about the results of tests done on their blood donations if the tests show signs of HIV (the virus that causes AIDS) or if the test results are ambiguous (unconfirmed). The content of the notification letter is determined by the combined results of tests done on the blood sample. If blood tests negative for HIV, the donor would not be contacted with that information.

Blood samples are tested several times before a donor is considered HIV-infected. In such cases, the Red Cross—

- Contacts the donor about the test results and explains these results in writing.
- Defers the donor indefinitely from donating blood. The donor's name and other information are placed in the confidential Red Cross Donor Deferral Register. This ensures that if the person donates at a Red Cross blood center in the future, the blood will not be used. The reason for deferral, however, is not made public.
- Encourages the donor to contact a physician.
- Sends a letter marked "confidential" to the donor's physician (only with the donor's written approval).

The Red Cross uses a variety of measures to communicate with a donor who is confirmed to be HIV-infected:

1. It may send a letter that does not contain details of the test results but asks the donor to make an appointment with the Red Cross. If there is no reply within two weeks, the Red Cross sends a letter as outlined in the third measure below.
2. It may contact the donor by telephone to schedule an appointment.
3. It may send a certified letter, marked "restricted delivery," which provides detailed information.

A donor would also be sent a letter if blood tests show signs of certain other germs.

People should not donate blood to find out whether they have HIV. The Red Cross and other blood banks test blood to safeguard the blood supply, not to provide a testing service for people who want to know their HIV status. Instead, people should call their local Red Cross or health department to find out where testing is available.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Red Cross. *Blood Services Directive 43.102.* 1992.
American Red Cross. *Blood Services Directive 4.56.* 1985.

If I store my own blood, is it tested?

Detailed: The Food and Drug Administration (FDA) recommends that all autologous blood donations (a person's own blood stored for his or her use only) be tested for signs of HIV (the virus that causes AIDS) and certain other germs. This person's physician would be notified of any results that relate to health status.

Basic: The Food and Drug Administration (FDA) recommends that all autologous blood donations (a person's own blood stored for his or her use only) be tested for signs of HIV (the virus that causes AIDS) and certain other germs.

Sources: Food and Drug Administration. *Guidance for Autologous Blood and Blood Components.* March 1989.
American Red Cross. *Blood Services Directive 4.37.* 1988.

What blood transfusion options are available in an emergency?

Detailed: Improved surgical methods that minimize blood loss have reduced the need for transfusions. Blood transfusion options usually considered during an emergency include—

- **Blood from the general blood supply.** This is by far the most common blood used because it is immediately available.
- **Blood salvage.** This type of transfusion uses the patient's own blood, which is washed and recycled during surgery. Blood that would otherwise be lost is collected, processed on the spot, and returned to the patient. This procedure is especially suitable for thoracic (chest), abdominal, and orthopedic surgery.

Usually, autologous donations (a person's own blood stored for his or her use only) and designated or directed donations (blood provided by family or friends) are not suitable alternatives in an emergency because of special handling, testing, and transportation requirements.

Basic: During an emergency, people may use blood from the general blood supply or their own recycled blood.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
American Red Cross. "Giving and Receiving Blood." Fact sheet. June 1996.
American Red Cross. *Blood Services Directive 4.37.* 1988.

Do sperm banks screen for AIDS?
Do organ banks screen for AIDS?

Basic: AIDS is a result of infection caused by a virus (HIV). Sperm and organ banks should screen and test their donors to be sure that they do not show signs of HIV.

Detailed: AIDS is a result of infection caused by a virus (HIV). The Centers for Disease Control and Prevention (CDC) recommends that all sperm banks test potential donors for HIV, following these rigorous procedures:

- Interview all donors regarding risk factors for HIV infection.
- Conduct a physical exam on all donors for clinical evidence of HIV infection.
- Test all donors for signs of HIV at the time of donation.
- Retest the donors at least six months after the donations, which are frozen in the interim.

Sperm banks should allow the use of sperm donations only from donors who repeatedly test HIV-negative.

Of the many thousands of organ and tissue transplants in the United States since 1985, only a few have involved HIV transmission. In 1994, the Public Health Service (PHS) released revised recommendations for preventing HIV transmission through transplantation involving kidneys, livers, bone, skin, and other tissue used for transplantation in people. The intent of these recommendations is to prevent the use of tissue (whether from the United States or other countries) that has the potential for transmitting HIV or that has not been properly tested. The recommendations include the following:

- Blood from a tissue donor must be tested for HIV-1 and HIV-2.
- Records must show that the donor's medical history shows no evidence of risk factors or clinical symptoms of HIV infection.

These recommendations (and the Interim Rule on transplanted tissue) cover written procedures, record keeping, inspections, and recall and destruction of collected tissue.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
AIDS, 1994; vol. 7 (suppl.). "HIV Transmission Through Blood, Tissues, and Organs." Peterson, L., et al.
Centers for Disease Control and Prevention. *MMWR,* 1994; vol. 43, no. RR-8.
Federal Register, December 14, 1993; vol. 58, no. 238. U.S. Department of Health and Human Services, Food and Drug Administration, 21 CFR Parts 16 and 1270, *Human Tissue Intended for Transplantation, Interim Rule.*
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Can I get AIDS from a hepatitis B vaccine?

DETAILED: No. AIDS is a result of infection caused by a virus (HIV) that spreads through sexual or blood-to-blood contact. The hepatitis B vaccine currently in use is generated entirely in the laboratory from yeast cultures and does not use human blood. The earlier version of the vaccine, which used purified blood components, was discontinued by its manufacturer. No one has ever become HIV-infected as a result of receiving either version of the hepatitis B vaccine.

BASIC: No.

Sources: *Physicians Desk Reference,* 50th ed. 1996.
New England Journal of Medicine, 1986; vol. 315, no. 4. "The Here and Now of Hepatitis B Immunization." Grady, G.
Centers for Disease Control and Prevention. *MMWR,* 1984; vol. 33, no. 49.
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More Facts About Children With HIV Infection

How many children have AIDS?

Detailed: As of December 1997, more than 8,086 children under age 13 were reported to have AIDS (a result of HIV infection). Many more children have HIV but have not yet been diagnosed with AIDS. As of December 1997, about 58 percent of the children with AIDS had died. In 1997, HIV infection became the seventh leading cause of death among children 1 to 14 years of age. In some cities in the northeastern United States, HIV infection is the leading cause of death among children ages 2 to 5.

Between 1992 and 1996, the number of children born with HIV who developed AIDS decreased by almost half. This decrease resulted from improvements in preventing the spread of HIV from women with HIV to their babies. In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several details about the use of AZT during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, possibilities of short-term therapy, and the impact on women's future treatment options. Scientists have been studying the use of combination therapy, including protease inhibitors, as a way to prevent mother-to-child HIV transmission. In 1998, the Centers for Disease Control and Prevention (CDC) released recommendations on the use of these drugs.

Basic: As of December 1997, 8,086 children under age 13 were reported to have AIDS (a result of HIV infection). By December 1997, more than half of the children with AIDS had died.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-4. "Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection."

Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.

National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

More Facts About Children With HIV Infection

Is the number of children with AIDS growing?

BASIC: Not anymore. Between 1992 and 1996, the number of children born with HIV (the virus that causes AIDS) who developed AIDS decreased by almost half. In the United States, nearly all new cases of children with HIV are children born to mothers with HIV.

DETAILED: Not anymore. Between 1992 and 1996, the number of children born with HIV (the virus that causes AIDS) who developed AIDS decreased by almost 50 percent. This decrease resulted from improvements in preventing transmission from women with HIV to their babies. In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several things about AZT use during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, possibilities of short-term therapy, and the impact on women's future treatment options.

Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

Now in the United States, nearly all new cases of children with HIV are children born to mothers with HIV. To ensure the health of both women and children, the most effective way to prevent HIV infection in babies is still to prevent HIV infection in women of childbearing age.

Sources: Centers for Disease Control and Prevention."Perinatal HIV Prevention Update: Evidence of Progress and Challenges for the Future." November 1997.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How many children with AIDS are African American or Hispanic?

DETAILED: Children of African American and Hispanic families are disproportionately represented among people with AIDS (a result of HIV infection). Although only 13 percent of all children in the United States are African American and only 16 percent are Hispanic, they account for 58 percent and 23 percent, respectively (about 81 percent combined total), of all reported AIDS cases in children.

BASIC: Children of African American and Hispanic families are disproportionately represented among people with AIDS (a result of HIV infection). Although only about 29 percent of all children in the United States are African American or Hispanic, they account for about 81 percent of all reported AIDS cases in children.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
U.S. Department of Commerce, Census Bureau. *U.S. Population for July 1, 1997.*

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

How many teenagers have AIDS?
How big a problem is AIDS among teenagers?

DETAILED: By the end of December 1997, 3,130 teenagers had AIDS (a result of HIV infection). These statistics do not account for teens who have HIV but have not yet developed AIDS. Because of the long time between infection and the onset of symptoms of AIDS, experts believe that most people in their twenties with AIDS actually became infected as teenagers. Current AIDS statistics, however, do not give an accurate picture of HIV infection among teenagers. Since 1991, HIV infection has been the sixth leading cause of death among young people age 15 to 24 in the United States.

BASIC: As of December 1997, 3,130 teenagers had AIDS (a result of HIV infection). Since 1991, HIV infection has been the sixth leading cause of death among young people ages 15 to 24 in the United States.

Sources: Centers for Disease Control and Prevention. "Adolescents and HIV/AIDS." March 1998.
Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report,* year-end 1997; vol. 9, no. 2.
National Institute of Allergy and Infectious Diseases. "HIV and Adolescents." Fact sheet. November 1997.
Centers for Disease Control and Prevention. *Facts About Adolescents and HIV/AIDS.* November 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What does perinatal transmission mean?

BASIC: Perinatal describes the period before, during, and just after the birth of a baby. Most children with HIV (the virus that causes AIDS) are infected perinatally.

DETAILED: Perinatal describes the period before, during, and just after the birth of a baby. Most children with HIV (the virus that causes AIDS) are infected perinatally.

A woman with HIV can spread HIV to her baby in the following ways:

- During pregnancy, the woman's blood nourishes the baby. If this blood has HIV, the virus could infect the baby.
- During regular (vaginal) delivery, the baby must pass through the woman's vagina. The baby comes into contact with her vaginal fluid as well as some blood. If these fluids are HIV-infected, they could infect the baby.
- During breast feeding, the baby could receive HIV in the milk. In the United States, experts recommend that women with HIV use a milk substitute (infant formula) to feed their babies.

In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several details about AZT use during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options.

Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born. Studies are being done to determine proper doses and to find out whether combination therapy during pregnancy leads to side effects for the mother or baby.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

Is there a way to keep HIV from spreading from an infected mother to her baby?

DETAILED: Yes. Without AZT (zidovudine) treatment, about 25 percent of babies of mothers with HIV (the virus that causes AIDS) are born with the virus. In 1994, researchers discovered that AZT given to pregnant women who had HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby by about two-thirds (to about 8 percent).

The women in the 1994 study had never taken AZT before and had T-helper (CD4) cell counts above 200/mL of blood. They were given AZT by mouth starting between 14 and 34 weeks of pregnancy and intravenous (IV) AZT during labor and delivery. In addition, the babies took AZT for six weeks after birth.

Because AZT has been shown to be effective, the Centers for Disease Control and Prevention (CDC) recommends routine HIV counseling and voluntary testing for all pregnant women. Scientists are studying several details about AZT as a way of preventing the transmission of HIV from mother to child. These details include—

- The possibility of long-term side effects for either the mother or baby.
- AZT's effectiveness in preventing infection in babies whose mothers have taken AZT or who have T-helper cell counts of 200/mL of blood or lower.
- The impact of taking AZT during pregnancy on women's future treatment options.
- Whether AZT taken in smaller doses or later in pregnancy may be an effective way of preventing HIV infection in babies whose mothers have HIV.

Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born. Studies are being done to determine proper doses and to find out whether combination therapy, including protease inhibitors, during pregnancy leads to side effects for the mother or baby.

Researchers are also studying factors that may affect the transmission of HIV from mothers with the virus to their babies. To ensure the health of both women and children, the most effective way to prevent HIV infection in babies is still to prevent HIV infection in women of childbearing age.

BASIC: Yes. Treatment with AZT (zidovudine) has been shown to greatly reduce the rate of transmission from women with HIV (the virus that causes AIDS) to their babies. Because AZT has been shown to be effective, the Centers for Disease Control and Prevention (CDC) recommends routine HIV counseling and voluntary testing for all pregnant women. Researchers are also learning more about other factors that influence the transmission of HIV from mothers with HIV to their babies.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

Centers for Disease Control and Prevention. "Perinatal HIV Prevention Update: Evidence of Progress and Challenges for the Future." November 1997.

Centers for Disease Control and Prevention. "Finding Solutions for Mother-to-Infant HIV Transmission in the Developing World: Background and Selected Opinions." October 1997.

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."

National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

Are young women infected with HIV more easily than older women?

Basic: Yes. For physical and social reasons, young women can be infected with HIV (the virus that causes AIDS) and germs that cause other sexually transmitted diseases (STDs) more easily than older women.

Detailed: Yes. Young women can be infected with HIV (the virus that causes AIDS) and germs that cause other sexually transmitted diseases (STDs) more easily than older women for both physical and social reasons. Following are some reasons why this is true:

- A young woman's vagina has a thinner lining than the vagina of an older woman. Because a thinner lining can be more easily injured, it is a less effective barrier against HIV and other germs that cause STDs.
- A young woman's vagina produces less mucus than the vagina of an older woman who has not reached menopause. Mucus acts as a lubricant to protect the vagina from injury; it also acts as a barrier to germs, including HIV. By flushing the cervix and vagina, mucus helps keep germs away. Immune factors in the mucus also help protect against infection. If there is less mucus—as in young women—there is less protection.
- Young women age 13 to 19 have cells on the cervix (the opening to the uterus) that are more sensitive to germs that cause certain STDs.
- Young women are the most frequent victims of incest, rape, and adultery. Sex that is forced, hurried, or frequent can injure the vagina and surrounding tissues. Injury that causes bleeding or tearing of these tissues increases the chances of infection.
- Because of the power imbalance between men and women, young women may find it harder to practice risk reduction behaviors, such as using latex condoms, with male partners. This is especially true for young women age 13 to 19 whose first sex partners are older men.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Institute of Medicine. *The Hidden Epidemic: Confronting Sexually Transmitted Diseases.* Eng., T., and Butler, W., eds. 1997.

Rural Center for AIDS/STD Prevention. *RAP Time,* vol. 1, no. 2. "Female Teens Who First Have Sex with Older Males Are at Higher Risk for HIV Infection." December 5, 1997.

National Institute of Allergy and Infectious Diseases. "Growing Pains: Adolescents and STDs." Dateline NIAID. September 1996.

United Nations Development Programme. *Young Women: Silence, Susceptibility, and the HIV Epidemic.* No date.

Should children with AIDS attend school?

DETAILED: School attendance is important to a child's well-being. HIV (the virus that causes AIDS) is not spread by everyday casual contact or by school activities. According to the National Association of State Boards of Education (NASBE), school officials should decide about the school attendance of children with HIV on a case-by-case basis. NASBE recommends that officials follow established policies and procedures for students with chronic health problems or disabilities. For example, officials should consult with the infected child's doctor and parents or guardians in a way that respects the privacy of the child and the family. Together, officials, doctors, and parents should look at health concerns and agree on a plan to support the child with HIV and provide for any special needs. Like all students, children with HIV may be asked to stay home while they have another infection, such as tuberculosis, that could affect others.

BASIC: HIV (the virus that causes AIDS) is not spread by everyday casual contact or by school activities. According to the National Association of State Boards of Education (NASBE), school officials should decide about the school attendance of children with HIV on a case-by-case basis. NASBE recommends that officials follow established policies and procedures to ensure the safety of everyone in the school setting and to protect the rights of children with HIV.

Sources: National Association of State Boards of Education. *Someone at School Has AIDS: The Complete Guide to Education Policies Concerning HIV Infection.* 1996.
U.S. Department of Health and Human Services. *Family-Centered Comprehensive Care for Children With HIV Infection.* August 1991.

I know that mothers with HIV can infect their babies. But how do mothers themselves get infected?

DETAILED: AIDS (a result of HIV infection) is caused by a virus (HIV). Most mothers who have HIV became infected through—

- Sharing needles and syringes with a partner who has HIV.
- Having sex with a partner who has HIV.

As of December 1997, in the United States, about 53 percent of parents (mother, father, or both) of children with AIDS shared needles and syringes or had sex with an HIV-infected partner who also took these risks.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Most mothers of children with HIV got the virus from either sharing needles and syringes or having sex with a partner who has HIV.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report*, year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

What can a pregnant woman do if she has HIV?

Basic: Both a pregnant woman with HIV (the virus that causes AIDS) and her baby can benefit if the woman sees a doctor as soon as possible and has regular prenatal checkups. Use of AZT (zidovudine) during pregnancy and after birth has been shown to greatly reduce the rate of HIV transmission from mothers with HIV to their babies.

Detailed: Both a pregnant woman with HIV (the virus that causes AIDS) and her baby can benefit if the woman sees a doctor as soon as possible and has regular prenatal checkups. Use of AZT (zidovudine) during pregnancy and after birth has been shown to greatly reduce the rate of HIV transmission from mothers with HIV to their babies. Research documented the success of this treatment in 1994. Because of this success, the Centers for Disease Control and Prevention (CDC) recommends the use of AZT by pregnant women who have HIV.

Scientists are still studying several details about AZT use during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

A pregnant woman with HIV may wish to discuss reproductive options with a health care professional. Researchers are studying the effects of pregnancy on women with HIV. Because women with HIV have health concerns apart from pregnancy, they may also wish to explore their options for ongoing medical care, treatment, and support and social services.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."
Centers for Disease Control and Prevention. "Perinatal HIV Prevention Update: Evidence of Progress and Challenges for the Future." November 1997.
Cotton, D., and Watts, D., eds. *The Medical Management of AIDS in Women.* 1997.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.
Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."
National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

Can semen from men with HIV be made safe for use in artificial insemination?

DETAILED: Not at this time. There is no evidence that any procedure can reliably eliminate HIV (the virus that causes AIDS) from semen. Although researchers have used a technique known as "sperm washing" to remove sperm* from infected semen, the effectiveness of this procedure has not been proven. The Centers for Disease Control and Prevention (CDC) recommends against insemination with semen from men who have HIV.

* Sperm are the cells in semen that can fertilize eggs from the female. Semen is the whitish fluid that contains sperm and that comes out of the penis during orgasm.

BASIC: Not at this time. No studies have shown that HIV (the virus that causes AIDS) can reliably be removed from semen. The Centers for Disease Control and Prevention (CDC) recommends against insemination with semen from men with HIV.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed., 1994.

National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

Centers for Disease Control and Prevention. *MMWR,* 1990; vol. 39, no. 15.

Why do only some babies of infected mothers get HIV?

BASIC: Scientists are studying why some babies of mothers with HIV (the virus that causes AIDS) become infected and why some do not. Some of the factors that may increase a baby's risk of becoming infected include a mother's damaged immune system during pregnancy, delivery more than four hours after the mother's water breaks, and high levels of HIV in the mother's bloodstream (viral load).

DETAILED: Scientists are studying the following factors to see if they increase a baby's chances of becoming infected with HIV (the virus that causes AIDS):

- A low number of T-helper cells (immune system cells) in the woman during pregnancy
- Birth more than four hours after the mother's water breaks
- A viral load (level of HIV in the bloodstream) higher than 50,000 copies/mL of plasma in the woman during pregnancy
- Drug use by the mother during pregnancy
- Severe inflammation of fetal membranes
- Premature (early) delivery
- Low vitamin A levels in the woman during pregnancy
- Prolonged exposure to the mother's blood or vaginal fluid (for example, during a long delivery)

The following factors may decrease a baby's chances of becoming infected with HIV:

- AZT treatment for the woman during pregnancy and for the baby after birth
- Presence of neutralizing HIV antibodies—antibodies that can hold the virus in check for a period of time—in the woman

Researchers are studying whether delivery by Cesarian section reduces the risk of HIV infection in a baby. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

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National Institute of Allergy and Infectious Diseases. "Studies Shed New Light on Mother-to-Infant HIV Transmission." News release. June 19, 1996.

Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."

Can only a mother with AIDS, not just HIV, spread the virus to her baby?

DETAILED: A baby born to a woman with HIV, whether or not she has developed AIDS, can be born infected. Even women with HIV who have no signs of infection can have babies who are born with HIV.

Without AZT (zidovudine) treatment, about 25 percent of babies born to women with HIV are infected. In 1994, researchers discovered that AZT (zidovudine) given both to pregnant women with HIV and to their babies after birth reduced the rate of HIV transmission from mother to baby from about 25 percent to about 8 percent. Scientists are still studying several details about AZT use during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options.

Because of the demonstrated effectiveness of treatment with AZT, the Centers for Disease Control and Prevention (CDC) recommends routine HIV counseling and voluntary testing for all pregnant women. In addition, some experts suggest that health care workers offer testing to women who wish to have children, to help them weigh the risks of pregnancy before becoming pregnant.

Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

To ensure the health of both women and children, however, the most effective way to prevent HIV infection in babies is still to prevent HIV infection in women.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Babies born to women with HIV can be born infected. The baby's mother does not need to have developed AIDS for the baby to become infected.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."

National Institute of Allergy and Infectious Diseases. "AZT Reduces Rate of Maternal Testing of HIV." News release. February 21, 1994.

If a mother gets HIV after childbirth, can her baby still get HIV?

BASIC: Yes. If they breast feed, women who become infected with HIV (the virus that causes AIDS) after childbirth can spread HIV to their babies.

DETAILED: Yes. If they breast feed, women who become infected with HIV (the virus that causes AIDS) after childbirth can spread HIV to their babies. In the United States, experts suggest that women with HIV avoid breast feeding their babies to ensure that babies who did not become infected during pregnancy or delivery stay free of the virus. In some countries, however, there may be no adequate substitute for breast milk. Women with HIV who do not have the option of using formula are advised to continue breast feeding their babies because the nutritional and health benefits to the child outweigh the risk of HIV infection.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.
Centers for Disease Control and Prevention. *MMWR,* 1995; vol. 44, no. RR-7. "U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women."
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Does a negative antibody test mean that a baby doesn't have HIV?

BASIC: Yes, in most cases. A baby who tests negative usually does not have HIV (the virus that causes AIDS).

DETAILED: Yes, in most cases. A negative result on a baby's HIV antibody test usually means that the baby is not infected with HIV (the virus that causes AIDS). Because babies receive a variety of antibodies from their mothers just before birth, babies may receive antibodies to HIV if their mothers are infected. Some babies receive HIV antibodies, but not the virus itself, from their HIV-infected mothers. It is unlikely for a baby to receive HIV from his or her mother without also receiving HIV antibodies. As a result, a baby who tests negative for antibodies to HIV probably does not have the virus.

A negative test may not completely rule out HIV infection, however, especially if the test is given to the baby in the first 15 months of life. A few babies are born with disorders that keep them from making antibodies of any kind. Babies with this condition could test negative even if they have HIV. Also, a baby could become infected after birth through breast feeding, even if the mother becomes infected after the baby is born. Finally, a baby could be infected but still test negative if he or she recently received an infected blood transfusion. This is highly unlikely because the Red Cross and other blood banks in the United States have tested all blood for signs of HIV since 1985. The risk of become infected through a blood transfusion is now extremely low.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
Pediatric Clinics of North America, 1994; vol. 41, no. 4. "Molecular Genetic Analysis of the Primary Immune Disorders." Nelson, D., and Kurman, C.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

How does AIDS in babies and children differ from AIDS in adults?

DETAILED: Babies and children with HIV (the virus that causes AIDS) are more likely than adults with HIV to have—

- Bacterial infections.
- "Failure to thrive," including problems growing and gaining weight.
- Anemia (low level of iron in the blood).
- Damaged nervous systems.
- Developmental disabilities.

Also, babies and children with HIV are less likely than adults with HIV to have opportunistic infections of the central nervous system, fungal infections, viral infections, and cancers.

Scientists believe that babies with HIV differ from adults with HIV because babies are not born with fully functioning immune systems. The immune system serves the following two functions:

1. Makes antibodies against germs
2. Attacks and surrounds these germs

When babies and children develop AIDS, both functions of the immune system tend to fail. Adults with HIV, however, lose mainly the second function when they develop AIDS. These adults tend to develop viral, parasitic, and fungal (but not bacterial) infections. Nevertheless, like adults, babies and children with AIDS may suffer from—

- Weight loss.
- Persistent diarrhea.
- Recurrent fever.
- Swollen lymph glands.
- Severe thrush (oral fungus infection).
- *Pneumocystis carinii* pneumonia.

BASIC: AIDS (a result of HIV infection) is caused by a virus (HIV). Babies and children who have the virus are more likely than infected adults to get bacterial infections. Many babies and children with HIV have problems growing and gaining weight and may have the kind of nervous system damage that causes developmental difficulties.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

How long do babies with AIDS live?

BASIC: Although many babies in the United States who are born with HIV (the virus that causes AIDS) live more than eight or nine years, some live only up to four. Researchers are looking for treatments to help babies and children with HIV live longer, healthier lives.

DETAILED: Although many babies in the United States who are born with HIV (the virus that causes AIDS) live more than eight or nine years, some live only up to four. Statistical analyses give the following estimates:

- About 80 percent of babies who are born with HIV do not develop AIDS symptoms until they enter school or become teenagers. They are likely to live more than eight or nine years.
- About 20 percent of babies who are born with HIV are likely to develop symptoms of AIDS within the first year of life and die by the time they are four years old.

Researchers are unsure why there is this difference in life span. Some possibilities include the point at which a baby became infected during pregnancy, the age at which a child develops AIDS, and the opportunistic infections a child gets after developing AIDS.

Advances in medical care and antiviral drugs have improved the health of babies and children with HIV. Researchers are looking for other treatments to help babies and children with HIV live longer, healthier lives.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.
AIDS, 1994; vol. 8 (suppl. 1). "Long-Term Survivors of HIV-1 Infection: Definitions and Research Challenges." Schrager, L.K., et al.

What percentage of children with AIDS have died?

Detailed: As of December 1997, about 58 percent of children with AIDS (a result of HIV infection) in the United States had died. AIDS is the seventh leading cause of death of children 1 to 14 years of age. However, better treatments and advances in medical care are helping people with HIV, including children, live longer, healthier lives.

Basic: As of December 1997, more than half the children with AIDS (a result of HIV infection) in the United States had died.

Sources: Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report*, year-end 1997; vol. 9, no. 2.
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.
National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What kind of medicine do doctors give to children with HIV?

Basic: Children with HIV (the virus that causes AIDS) take antiviral drugs to suppress HIV as well as drugs to prevent or treat opportunistic infections.

Detailed: Children with HIV (the virus that causes AIDS) take a variety of antiviral drugs—drugs that work directly against the virus. Like adults, children take nucleoside analogues, one type of antiviral drug. These include AZT (zidovudine), ddI (didanosine), and 3TC (lamivudine). In 1997, researchers confirmed that AZT, in combination with ddI or 3TC, is more effective than AZT alone for children with HIV who have symptoms.

In 1997, two protease inhibitors, which are a newer type of antiviral drug, were approved for use in children ages 2 to 13. Scientists are now testing other protease inhibitors in children to determine proper doses.

Children with HIV also take drugs to prevent or treat opportunistic infections. Many drugs used by adults are effective in children when given in appropriate doses. For example, trimethoprim-sulfamethoxazole, a drug used to prevent *Pneumocystis carinii* pneumonia, is used in both adults and children. Children with HIV may also take drugs against tuberculosis, *Mycobacterium avium* complex (MAC), chicken pox, and shingles. Researchers are studying how drugs used against other opportunistic infections work in children.

In addition, some children with AIDS take immune products such as intravenous immunoglobulin (IVIG). This treatment contains many types of antibodies, which can reduce bacterial infections.

Researchers continue to look for new and better treatments for children. Current studies include the investigation of vaccines, antiviral drugs, and treatments for opportunistic infections. Also, experts are looking for ways to prevent transmission of the virus from an infected mother to her baby. In 1994, researchers discovered that AZT given both to pregnant women with HIV and their babies after birth greatly reduces the rate of HIV transmission from mother to baby. Scientists are studying several details about AZT use during pregnancy, including the possibility of side effects for either the mother or baby, its effectiveness when taken by women in different stages of HIV infection, and its impact on women's future treatment options. Great advances have been made in understanding how HIV affects the immune system and how HIV infection can be monitored and treated. This greater understanding has led to recommendations for more aggressive treatment with combination therapy, including protease inhibitors, both for treating pregnant women and for preventing HIV infection in babies before they are born.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-4. "Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection."

Centers for Disease Control and Prevention. *MMWR,* 1998; vol. 47, no. RR-2. "Public Health Service Task Force Recommendations for the Use of Antiretroviral Drugs in Pregnant Women Infected with HIV-1 for Maternal Health and for Reducing Perinatal HIV-1 Transmission in the United States."

Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. RR-12. "1997 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

National Institute of Allergy and Infectious Diseases. "Two Drugs Better Than One for Treating Children with Symptomatic HIV." News release. June 26, 1997.

National Institute of Allergy and Infectious Diseases. "Pediatric AIDS." Fact sheet. April 1997.

Food and Drug Administration. "FDA Approves First Protease Inhibitors with Labeling for Use in Children." Press Release P97-11. March 14, 1997.

National Institute of Allergy and Infectious Diseases. "Clinical Trials for AIDS Therapies." Fact sheet. February 1997.

Can children with AIDS get vaccinated against other diseases?

Detailed: Yes. In general, children with HIV (the virus that causes AIDS) can get vaccinations that children usually get. Vaccinations are important for children with HIV because they are especially vulnerable to the serious consequences of diseases such as measles.

Like other children, children with HIV should get vaccinated against—

- Hepatitis B (Hep B).
- Diphtheria, tetanus, and pertussis (DPT or DTaP).
- *Haemophilus influenzae* Type B (Hib).

Children with HIV should also get the following vaccinations, in a different form or given on a different schedule than those given to children who are not HIV-infected:

- Inactivated (not the usual oral) polio (IPV)
- Measles, mumps, and rubella (MMR)—Not recommended for children with severely damaged immune systems
- Influenza
- *Streptococcus pneumoniae*

Children with HIV should *not* get varicella vaccine.

Children with HIV or AIDS need to be seen by a doctor about the timing of vaccinations and for other health concerns.

Basic: Yes. In general, children with HIV (the virus that causes AIDS), whether or not they have developed AIDS, can get vaccinations that children usually get.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. RR-12. "1997 USPHS/IDSA Guidelines for the Prevention of Opportunistic Infections in Persons Infected with Human Immunodeficiency Virus."
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Do all babies with AIDS who are in the hospital need to be there?

BASIC: Some babies stay in the hospital longer than is medically necessary. Some of these babies have HIV (the virus that causes AIDS). The parents of babies with HIV are often too sick themselves to care for their infants, or the parents may have already died.

DETAILED: Some babies remain in the hospital longer than is medically necessary. These babies are called "boarder" babies. Not every boarder baby has HIV. Some babies are in the hospital for reasons unrelated to HIV infection. Some are suspected to have HIV because they were born to mothers at risk for the virus. Other babies are born to parents with HIV who either are too sick to care for their children or who may have already died. Many babies and children with AIDS are born into families whose social and financial situations prevent them from caring for their children at home. These children might have to remain in the hospital even if they do not need extensive medical care.

Foster families, community homes, and adoptive parents are resources for the care of children with HIV. Such resources, however, are limited for a variety of reasons.

Sources: U.S. Department of Health and Human Services. *Report to the Congress: National Estimates on the Number of Boarder Babies, the Cost of Their Care, and the Number of Abandoned Infants.* 1994.
Pediatric AIDS Foundation. Fact sheet. 1993.
U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.
U.S. Department of Health and Human Services. *Family-Centered Comprehensive Care for Children With HIV Infection.* August 1991.

7

More Facts About Social Impact of HIV Infection

What does medical care cost for a person who has AIDS?

Detailed: AIDS is a result of HIV infection. In 1993, the estimated cost of medical care for a person with HIV (the virus that causes AIDS), from the time of infection until death, was $119,000. This estimate included $50,000 for medical care until the person developed AIDS and $69,000 for care after the onset of AIDS. With the introduction of combination therapy, including protease inhibitors, this estimate will likely change. Even though combination therapy is expensive, the cost may be balanced by the personal and social benefits of this therapy to people with HIV, who may be able to continue leading productive lives.

Two revised estimates of the cost of treatment follow:

- A 1997 California study estimated a cost of more than $10,000 per year for combination therapy and monitoring alone. This figure assumes that no medical problems will occur from taking the medicines.
- An economic model developed the same year estimated lifetime medical costs of $195,000 for a person with HIV. Researchers cautioned that their estimate is open to change, because no one yet knows how combination therapy, including protease inhibitors, will affect the survival of people with HIV and the development of HIV infection.

Basic: AIDS is a result of HIV infection. With the introduction of combination therapy, including protease inhibitors, the previous estimate of $119,000 will likely change, when experts decide how to account for combination therapy in an estimate of lifetime costs for HIV infection. Even though combination therapy is expensive, the cost may be balanced by the personal and social benefits of this therapy to people with HIV, who may be able to continue leading productive lives.

Sources: *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology,* 1997; vol. 16, no. 1. "Updates of Cost of Illness and Quality of Life Estimates for Use in Economic Evaluations of HIV Prevention Programs." Holtgrave, D.R., and Pinkerton, S.D.

Journal of the American Medical Association, 1997; vol. 277, no. 2. "HIV-1 Protease Inhibitors: A Review for Clinicians." Deeks, S.G., et al.

Journal of the American Medical Association, 1993; vol. 270, no. 4. "The Lifetime Cost of Treating a Person With HIV." Hellinger, F.

For current statistics, contact the CDC National AIDS Hotline (800/342-AIDS), Spanish (800/344-7432), TTY/TDD (800/243-7889); the CDC Voice and Fax Information System (888/232-3228); the CDC National Prevention Information Network (800/458-5231) or its Website at www.cdcnac.org; or the CDC HIV/AIDS Website at www.cdc.gov/nchstp/hiv_aids/dhap.

What might change estimates of future medical costs of AIDS?

BASIC: Combination therapy, including protease inhibitors, is one of the factors that could affect future medical costs of AIDS (a result of HIV infection), in ways that are difficult to predict.

DETAILED: Several factors could affect future medical costs of AIDS (a result of HIV infection), in ways that are difficult to predict:

- Combination therapy, including protease inhibitors, given to people who have HIV (the virus that causes AIDS) before their immune systems become damaged. Even though combination therapy is expensive, the cost may be balanced by the personal and social benefits of this therapy to people with HIV, who may be able to continue leading productive lives. At this time, experts do not know how long people with HIV need to have combination therapy to realize its benefits.
- Treatments for opportunistic infections to lessen their severity or frequency, which could cut hospital costs. Treatments might also improve the quality of life for people with HIV so that they can work longer and live better. Outpatient treatments for *Pneumocystis carinii* pneumonia have clearly improved the quality of life for some people with HIV. Some treatments, however, could be expensive and might need to be taken indefinitely, with supporting medical care. They also could extend life for people, without helping them remain productive.
- Case management to help contain costs by coordinating services. Case management could raise medical costs by increasing the demands for health care by previously underserved people.
- Changes in the assumptions that predictive models make.

Factors that could lower the estimated future medical costs of AIDS include a cure or vaccine for HIV infection.

Sources: *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology,* 1997; vol. 16, no. 1. "Updates of Cost of Illness and Quality of Life Estimates for Use in Economic Evaluations of HIV Prevention Programs." Holtgrave, D.R., and Pinkerton, S.D.

Journal of the American Medical Association, 1997; vol. 277, no. 2. "HIV-1 Protease Inhibitors: A Review for Clinicians." Deeks, S.G., et al.

Mann, J., and Tarantola, D., eds. *AIDS in the World II: Global Dimensions, Social Roots, and Responses.* 1996.

National Research Council. *The Social Impact of AIDS in the United States.* 1993.

How do most people with AIDS pay for their medical care?

DETAILED: Like most Americans, people with HIV (the virus that causes AIDS) usually pay for their medical care with coverage provided either by private insurance plans available through their work or by government-funded programs. People with HIV who develop AIDS (a result of HIV infection), however, may stop working.

If former employees were covered by a group policy connected with work, they can continue their coverage for a certain period, but at their own expense. (This is known as a COBRA extension, which lasts from 18 to 36 months.) After the extension ends, former employees no longer have that coverage. They must pay for their medical care themselves (a very expensive option), buy new insurance (very difficult to do), or apply for government programs.

Several government programs help pay for the medical care of people with HIV. People with HIV who meet disability standards (set by the Social Security Administration) and who have few assets, low income, or high medical bills that reduce their income to poverty levels may qualify for Medicaid. (Many people with HIV must become poor to qualify for government help in paying for their medical care.) Medicaid, a combined federal and state program, funds the medical care of 60 percent of adults and 90 percent of children with HIV.

The AIDS Drug Assistance Program (ADAP), funded by the federal and state governments, buys prescription drugs for people with HIV who otherwise would not be able to buy them. ADAP, which was first used to pay for treatment of people with AIDS before they qualified for Medicaid, now helps people with HIV pay for combination therapy, including protease inhibitors. Because these drugs are expensive and demand for them is increasing, some states are making hard decisions about which prescribed drugs they will cover.

The Ryan White Comprehensive AIDS Resources Emergency Act of 1990 (P.L. 101-381) provides emergency funding to communities with high rates of HIV infection. Representative community boards decide how to allocate money, which can be used to support HIV-related medical services for people who cannot afford them.

People with AIDS may qualify for Medicare, a federally funded program that provides benefits to retired people and people with disabilities who meet eligibility requirements. Medicare now pays for more medical care of people with AIDS than does Ryan White funding. In the future, Medicare will cover even more people with AIDS, because more people will survive longer with improved treatments.

BASIC: Like most Americans, people with HIV (the virus that causes AIDS) usually pay for their medical care with coverage provided either by private insurance plans available through their work or by government-funded programs.

Sources: *Journal of the American Medical Association,* 1997; vol. 277, no. 2. "HIV-1 Protease Inhibitors: A Review for Clinicians." Deeks, S.G., et al.

National Association of People With AIDS. *Making Medicaid Managed Care Work: An Action Plan for People Living With HIV.* February 1997.

Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.

Can people with AIDS get new health insurance?

BASIC: Probably not. Like people with other serious health problems, people with HIV (the virus that causes AIDS) have a hard time getting new individual health insurance.

DETAILED: Probably not. Like people with other serious health problems, people with HIV (the virus that causes AIDS) have a hard time getting new individual health insurance. When they apply for individual policies (as opposed to a group policy connected with the workplace), people with HIV are often screened by private insurers and asked HIV-related questions. In almost all states, insurers may test blood to determine HIV status. Also, all policies exclude coverage for preexisting conditions for a period of time. About half the states offer "high-risk pools" for people who have preexisting conditions, such as HIV infection, and have a hard time obtaining coverage. Coverage is expensive, and people may have to join a waiting list before getting covered. The ways in which private insurers limit their exposure to financial risk make it difficult for people with HIV to get new individual insurance.

Many people with HIV depend on Medicaid, a government-funded program that pays the cost of health care for people who cannot afford it.

People with HIV may also want other kinds of insurance, such life and disability. These types of insurance have their own eligibility rules and procedures.

Sources: Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.
National Research Council. *The Social Impact of AIDS in the United States.* 1993.

What kinds of medical care for people with AIDS does Medicaid cover?

DETAILED: Because Medicaid is cosponsored by the federal and state governments, the exact coverage for people with AIDS (a result of HIV infection) varies from state to state. Required medical services provided by every state to people with HIV and others who qualify include—

- Inpatient and outpatient hospital care.
- Doctors' services.
- Nursing home and home health services.
- Visits to rural health clinics and federally qualified health centers.
- Laboratory and X-ray services.
- Family planning services.
- Nurse practitioner services.
- Early and periodic screening.
- Diagnostic and screening services for people under 21.
- Nurse midwife services.

Optional services include clinic services, prosthetic devices, hearing aids, and intermediate care facilities for the mentally retarded. Although it is up to the individual state whether to cover prescription drugs, most states include this benefit in their Medicaid coverage.

Medicaid programs are relying more on managed care plans to deliver services. In 1983, about 3 percent of people who received Medicaid benefits were enrolled in managed care. By 1996, more than one-third received services from managed care plans.

BASIC: For people with AIDS (a result of HIV infection) and for others who qualify, Medicaid pays for a variety of inpatient, outpatient, and other services. Coverage varies somewhat by state.

Sources: The Henry J. Kaiser Family Foundation. "Medicaid and Managed Care." Fact sheet. June 1997.
The Henry J. Kaiser Family Foundation. "The Medicaid Program at a Glance." Fact sheet. April 1997.
Journal of the American Medical Association, 1997; vol. 277, no. 2. "HIV-1 Protease Inhibitors: A Review for Clinicians." Deeks, S.G., et al.

Can people who have HIV or AIDS get help paying their bills?

BASIC: Yes. People with HIV (the virus that causes AIDS) or AIDS (a result of HIV infection) who are unable to work or function because of their medical conditions can apply for benefits under two federal programs: the Social Security Disability Insurance program and the Supplemental Security Income program.

DETAILED: Yes. People with HIV (the virus that causes AIDS) or AIDS (a result of HIV infection) can apply for income benefits under two federal programs run by the Social Security Administration (SSA): the Social Security Disability Insurance program and the Supplemental Security Income program. Both programs cover people who are unable to work or function because of medical conditions that last longer than one year. Regulations to determine eligibility include conditions specific to women and children.

The SSA assesses HIV infection differently from the Centers for Disease Control and Prevention (CDC). The CDC monitors HIV infection for purposes of surveillance, epidemiology, behavioral science, and prevention, whereas SSA determines how HIV infection affects a person's ability to work or function.

SSA benefits are for adults and children with HIV who have "marked limitations" that affect their daily lives. Also, "work incentives" provide transition benefits that help people return to work after a period of disability.

Sources: Social Security Administration. *A Guide to Social Security and SSI Disability Benefits for People With HIV Infection.* May 1997.

Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.

How does the federal government divide money for different AIDS activities?

DETAILED: In 1996, the federal government allocated about $7.52 billion to activities related to HIV (the virus that causes AIDS). The 1997 budget increased spending for HIV and AIDS to about $8.45 billion. For 1998, the estimated budget request called for about $8.87 billion. The money was divided among four categories:

HIV/AIDS Activity in the Federal Budget by Percent

	1996	1997	1998 (Estimated)
Research	22 %	21 %	21 %
Prevention	8	8	8
Treatment	54	56	57
Income Support	15	15	14

Notes: 1996 and 1997 figures are actual; 1998 figures are as estimated in the presidential budget.
Treatment includes the federal portion of Medicaid, Medicare, and other programs.
Because percentages are rounded off to the nearest whole number, columns may not add up to 100 percent.

BASIC: The federal government allocates money to several activities related to HIV (the virus that causes AIDS):

- Research
- Prevention
- Treatment
- Income support

Sources: U.S. Department of Health and Human Services. "HIV/AIDS Total Federal Government Spending (by Function)." February 23, 1998.
U.S. Department of Health and Human Services. "AIDS/HIV Total Federal Government Spending (by Function)." February 3, 1997.

To protect hospital workers, why don't we test everyone for AIDS who goes to the hospital?

BASIC: Health care workers can protect themselves from HIV (the virus that causes AIDS) by following universal precautions while taking care of all patients and by following regulations covering work that involves the possibility of exposure to blood. The Occupational Safety and Health Administration (OSHA) issued these regulations in 1991.

DETAILED: Hospital workers can protect themselves from HIV (the virus that causes AIDS) by following universal precautions while taking care of all patients. Also, regulations issued by the Occupational Safety and Health Administration (OSHA) help protect workers with a "reasonable anticipation of exposure to blood."

Testing patients for HIV is not as useful as following universal precautions because—

- Some recently infected patients can test negative for HIV antibodies even though they have the virus. If health care workers rely on testing, they may not take precautions to avoid contact with patients' blood and other fluids. Testing does not replace universal precautions in infection control.
- Health care workers' risk of getting HIV from needle jabs or other injuries from HIV-contaminated objects are estimated to be less than 1 percent.
- Patients can have other bloodborne diseases besides HIV. If patients are tested only for HIV, health care workers can still be at risk for other bloodborne diseases (such as hepatitis B, which kills 200 health care and dental workers a year) if they ignore universal precautions.

Since 1993, the Centers for Disease Control and Prevention (CDC) has recommended that hospitals that treat large numbers of patients with HIV strongly consider adopting a policy of offering HIV counseling and testing routinely to patients 15 to 54 years old and keeping these test results confidential. CDC also recommends against hospitals denying services to patients who have positive test results.

The National Commission on AIDS in 1991 estimated that it would cost $1.5 billion per year to test all hospitalized patients in the United States. Even if a program of testing patients were paired with a program of testing all health care workers in the nation (costing $250 million), only four or five cases of HIV infection would be prevented each year.

Sources:

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Centers for Disease Control and Prevention. *MMWR,* 1993; vol. 42, no. RR-2.

National Commission on AIDS. *Preventing HIV Transmission in Health Care Settings.* July 1992.

Centers for Disease Control and Prevention. *MMWR,* 1991; vol. 40, no. RR-8. "Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures."

U.S. Department of Labor. Occupational Safety and Health Administration. *Occupational Exposure to Bloodborne Pathogens, Final Rule.* 29 CFR Part 1910.1030. December 6, 1991.

Centers for Disease Control and Prevention. *MMWR,* 1988; vol. 37, no. 24. "Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and Other Bloodborne Pathogens in Health-Care Settings."

Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 2S. "Recommendations for Prevention of HIV Transmission in Health-Care Settings."

Can a doctor notify a patient's spouse if that patient tests positive for AIDS?

DETAILED: When patients test positive for signs of HIV (the virus that causes AIDS), the confidentiality of the doctor-patient relationship may raise ethical dilemmas about notifying spouses and other partners about their risk of infection. Doctors should encourage their patients who have HIV to tell their sex or needle-sharing partners and to adopt prevention behavior. Doctors can also refer patients who want help with notifying their partners to the partner-notification program at the local health department. If patients who have HIV do not share the information, even after being counseled to do so, doctors themselves can notify partners, using confidential procedures in good faith.

To get public funding, state HIV prevention programs must have partner notification programs and make good faith efforts to notify the partners of people known to have HIV. Although these programs vary from state to state, doctors are not liable for disclosing possible risk of HIV infection to sex or needle-sharing partners, if they do so in good faith.

BASIC: When patients test positive for signs of HIV (the virus that causes AIDS), doctors should encourage them to tell their sex or needle-sharing partners. If patients who have HIV do not let their partners know about their possible risks, even after being counseled to do so, doctors themselves can notify partners, using confidential procedures in good faith.

Sources: *AIDS Education and Prevention*, 1997; vol. 9 (suppl. B). "Partner Notification for HIV Prevention: A Critical Reexamination." West, G.R., and Stark, K.A.

Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 47, no. RR-1. "1998 Guidelines for Treatment of Sexually Transmitted Diseases."

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed., 1994.

If a person's AIDS test is positive, does someone tell his or her sex partners?

BASIC: People who have HIV (the virus that causes AIDS) can get help in contacting sex or needle-sharing partners. With the voluntary cooperation of people who have HIV, partner notification programs help notify their partners of possible exposure to HIV. Like people who have HIV, partners also receive HIV prevention counseling, including information about risk reduction, HIV testing, and referrals to other services.

DETAILED: People who have HIV (the virus that causes AIDS) can get help in notifying sex or needle-sharing partners of their possible exposure to HIV through partner notification programs. Like people who have HIV, their partners also receive prevention counseling, including information about risk reduction, HIV testing, and referrals to other services.

With the voluntary cooperation of people with HIV, partners can be notified either by the HIV-infected people themselves (patient referral) or by trained public health workers (provider referral). Health workers encourage people with HIV to tell their partners about their possible exposure. Health workers also offer support to HIV-infected people in notifying partners. People who decide to have health workers contact their partners provide names and addresses to the health workers, who notify the partners, being careful to protect the confidentiality of everyone involved.

People with HIV may not be able to name all their partners, and health workers may not be able to locate them all. Providing current and accurate partner information increases the chances of all partners knowing about their risks.

People who want to know about partner notification services in their area can contact their local or state public health departments.

Sources: *AIDS Education and Prevention*, 1997; vol. 9 (suppl. B). "Partner Notification for HIV Prevention: A Critical Reexamination." West, G.R., and Stark, K.A.

Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 47, no. RR-1. "1998 Guidelines for Treatment of Sexually Transmitted Diseases."

I've heard that some other countries quarantine people with AIDS. Why don't we?

DETAILED: Quarantine would not be an appropriate public health tool to prevent the spread of HIV (the virus that causes AIDS). Quarantine is a strong public health measure that has been used against disease spread by casual contact. Because AIDS (a result of HIV infection) is not spread by everyday casual contact, public health experts, including former Surgeon General C. Everett Koop, M.D., say that a policy of quarantining (or more appropriately, isolating) all people with HIV would not be useful, for the following reasons:

- Education is the first line of defense against the spread of HIV.
- People can protect themselves, their families, and others by acting on the facts of how HIV is and is not spread.
- Measures such as quarantine or isolation would drive people who take risks "underground," making it harder to reach them with prevention programs.

Quarantine is a way to detain people who have been exposed to a germ and could be infected, so that they cannot spread the germ to others. *Isolation* is a way to detain people who have a germ, out of the belief that they could spread it to others.

Many states have laws that could be used to enforce the isolation of the few people with HIV who knowingly put their sex or needle-sharing partners at risk.

BASIC: Because HIV (the virus that causes AIDS) is not spread by everyday casual contact, a policy of quarantining or isolating all people with HIV would not be useful.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.

Cohen, P.T., et al., eds. *The AIDS Knowledge Base: A Textbook on HIV Disease from the University of California, San Francisco, and San Francisco General Hospital,* 2nd ed., 1994.

U.S. Department of Health and Human Services. *Surgeon General's Report to the American Public on HIV Infection and AIDS.* June 1993.

Bayer, R. *Private Acts, Social Consequences: AIDS and the Politics of Public Health.* 1989.

Is AIDS changing people's sexual behavior?

BASIC: Many studies show that some people are changing their sexual behavior to reflect what they have learned about safer sex. If more people are to protect themselves and others from HIV infection, however, more behavior change is needed.

DETAILED: We know very little about people's sexual behavior. We do know, however, that, as early as 1993, 96 percent of Americans understood that people can become infected with HIV (the virus that causes AIDS) from having sex with someone who has the virus. But there can be a difference between what people know and what they do.

Changing risk behavior to prevention behavior is key to stopping the spread of HIV. There are signs of change in sexual behavior, although the picture is mixed. For example, strong evidence exists that many men who have sex with men have changed their sexual behavior. However, some research shows that some people who practice safer sex with casual partners still have unsafe sex with their steady partners whose HIV status is not known. As another example, in a study of young urban adults who had sex with people of the opposite sex, about one-half reported that they had made at least one change in their sexual behavior, whereas the other half reported that they had made none at all.

Much research shows that condom use has increased. For example, a study of a program to encourage condom use among women who have sex with men and who were receiving care at sexually transmitted disease (STD) clinics in the United States reported that consistent condom use increased from 13 percent at the start of the study to 36 percent three months after the study ended.

Some experts are concerned that recent, dramatic gains in quality and length of life for people with HIV who have responded well to combination therapy will affect prevention behavior. Although it is too early to know what these effects will be, interviews with 54 men who had sex with men in 1997 showed some evidence of changed perceptions of risk: 26 percent said that they were "less concerned" about becoming infected through sex because of combination therapy. In addition, 13 percent reported that they were more willing to take the chance of getting infected through sex.

Most people know that HIV can be spread through sex, and many have taken steps to protect themselves and others. If more people are to protect themselves and others from HIV infection, however, more prevention behavior is needed.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 17. "Contraceptive Practices Before and After an Intervention Promoting Condom Use to Prevent HIV Infection and Other Sexually Transmitted Diseases Among Women—Selected US Sites, 1993–1995."

DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment and Prevention,* 4th ed. 1997.

National Institutes of Health."Interventions to Prevent HIV Risk Behaviors." Consensus Development Conference, Bethesda, MD, February 11–13, 1997.

New England Journal of Medicine, 1997; vol. 337, no. 7. "Are Advances in Treatment Changing Views about High-Risk Sex?" Letter to the editor. Dilley, J.W., et al.

Lancet, 1996; vol. 348. "HIV Prevention in Developed Countries." Coates, T.J., et al.

Public Health Reports, 1993; vol. 108, no. 5. "Changes in Sexual Behavior by Young Urban Heterosexual Adults in Response to the AIDS Epidemic." Melnick, S., et al.

Can foreigners with AIDS enter the United States?

DETAILED: No (with some exceptions). In general, nonresidents with HIV are inadmissible (not let into the country) under U.S. immigration laws because the Department of Health and Human Services considers HIV infection a "communicable disease of public health significance." Exceptions may be made on a case-by-case basis, weighing public benefit against public health risk. The attorney general can make exceptions for humanitarian reasons, family unity, and protection of the public interest. Nonresidents may seek a 10-day waiver for certain "designated events." In addition to meeting legal requirements, the applicant must not be a danger to public health, the possibility of the spread of infection must be minimal, and the applicant must be able to pay for medical and living expenses.

BASIC: No (with some exceptions).

Sources: Rubenstein, W., et al. *The Rights of People Who Are HIV Positive: The Authoritative ACLU Guide to the Rights of People Living With HIV Disease and AIDS.* 1996.

Immigration and Nationality Act. Section 212 (a)(1)(A)(i). 8 Code of Federal Regulations. 1993. Waiver Provision 212 (g)(i). Waiver Provision 212 (d)(3)(A). Waiver Provision 212 (d)(3)(B). Waiver Provision 212(a)(4).

What kinds of services are needed by families who are coping with HIV or AIDS?

DETAILED: Families living with HIV (the virus that causes AIDS) are often poor and have limited access to services. Some have a history of injection drug use or exposure to people who use drugs. Usually, more than one family member has HIV. Families coping with HIV need access to a wide range of medical and social services. These services include prevention education and support for behavior change, drug treatment, testing and counseling, medical care, mental health care, case management and coordination, crisis intervention, information and referral, family-to-family support, homemaking, nutrition services, child and respite care, housing, transportation, legal services, foster care or adoption services, and financial assistance. Families coping with HIV and AIDS need effective medical, psychosocial, and assistance programs. Programs need to be accessible, such as those offered in community clinics, and must be able to serve ethnically diverse populations.

BASIC: Families living with HIV (the virus that causes AIDS) are often poor and have limited access to services. Some have a history of injection drug use or exposure to people who use drugs. Usually, more than one family member has HIV. Families coping with HIV need access to a wide range of medical and social services. These services need to be accessible, such as those offered in community clinics, and must be able to serve ethnically diverse populations.

Sources: *Journal of HIV/AIDS Prevention & Education for Adolescents & Children,* 1997; vol. 1, no. 1. "Parental Expressed Needs: A Preliminary Guide for Services and Interventions." Wiener, L., et al.

U.S. Department of Health and Human Services. *Family-Centered Comprehensive Care for Children With HIV Infection.* 1991.

Child Welfare League of America, Inc. *Courage to Care.* 1990.

What usually happens to HIV-infected children and their families?

BASIC: Children with HIV (the virus that causes AIDS) and their families frequently live in poverty and lack adequate resources for food, clothing, shelter, and medical care. Most children with HIV are born to mothers who have HIV. In some cases, their mothers inject drugs or have sex with someone who has HIV. Usually, more than one family member is living with HIV. Families affected by HIV (the virus that causes AIDS) face multiple challenges as they try to meet their physical, social, and emotional needs. Regardless of their situations, these families need a variety of services to help them cope with HIV and AIDS.

DETAILED: Children with HIV are frequently born into single-parent families headed by a mother who has HIV. In some cases, the mother injects drugs or has sex with someone who has HIV. Usually, more than one family member is living with HIV.

Families affected by HIV often live in poverty and lack adequate resources for food, clothing, shelter, and medical care. They may be socially isolated or stigmatized and may have to look to their extended families for support and help. The needs of families affected by HIV may exceed their resources for many reasons, including unemployment and lack of health or life insurance.

Because a mother with HIV may be too ill to care for her children, her baby with HIV may be raised in a hospital or placed in foster care. Foster care may be hard to arrange because of the stresses of caring for a chronically ill child.

Children and family members who do not have HIV are also affected. Adult family members who do not have HIV may be unable or unwilling to take on the burdens of caring for family members with HIV. Children who do not have HIV may suffer neglect or abuse because the parent with HIV is physically or emotionally incapable of providing care. These children may need to be placed in foster or group care. If they stay with their families, these children may face long periods of separation from an infected parent who is hospitalized. Children who do not have HIV also may have to face the deaths of their infected parents and infected siblings.

Families coping with HIV face multiple challenges as they try to meet their physical, social, and emotional needs. Regardless of their situations, these families need access to services that will help them cope with HIV and AIDS.

Sources: *Journal of HIV/AIDS Prevention & Education for Adolescents & Children,* 1997; vol. 1, no. 1. "Parental Expressed Needs: A Preliminary Guide for Services and Interventions." Wiener, L., et al.

Journal of the American Medical Association, 1992; vol. 268, no. 24. "The 'Silent' Legacy of AIDS: Children Who Survive Their Parents and Siblings." Editorial. Nicholas, S.W., and Abrams, E.J.

National Commission on AIDS. *America Living With AIDS: Transforming Anger, Fear, and Indifference Into Action.* 1991.

U.S. Department of Health and Human Services. *Family-Centered Comprehensive Care for Children With HIV Infection.* August 1991.

Child Welfare League of America, Inc. *Courage to Care.* 1990.

What kind of HIV/AIDS services and programs do teenagers need?

DETAILED: Teenagers need prevention programs that provide necessary information and prevention skills development. They especially need to know how to prevent HIV infection resulting from sex and drug and alcohol use. These programs could be offered through schools or community organizations that work specifically with teens.

Teenagers' legal status makes many other services they need difficult to obtain. Services either may not exist or may be unsuitable for teenagers. Sometimes, because of cost or lack of confidentiality, teens do not use services that do exist.

Ideally, services for teens would be community-based and would include the following:

- HIV testing and counseling
- Drug treatment programs
- Primary care and specialized medical services, including treatment
- Information about and referrals to agencies serving youth
- Mental health and support programs

Teens also need access to national clinical trials for HIV treatments.

BASIC: Teenagers need prevention education programs that provide clear, realistic, and specific messages about how to prevent HIV infection resulting from sex and drug and alcohol use. Teenagers also need a variety of community-based services and programs specifically for young people.

Sources: National Institute of Allergy and Infectious Diseases. "HIV and Adolescents." Fact sheet. November 1997.
National Center for Youth Law. *Adolescents and HIV: Legal and Ethical Issues.* 1992.
National Commission on AIDS. *America Living With AIDS: Transforming Anger, Fear, and Indifference Into Action.* 1991.

8

More Facts About First Aid, CPR, and Aquatics

I'm a CPR instructor, and I'm having trouble convincing participants that the manikins are safe to use. How can I convince them?

DETAILED: First, CPR instructors can make sure participants know that HIV (the virus that causes AIDS) spreads from person to person through sexual and blood-to-blood contact. The following procedures may further reassure them:

- Make sure that the manikins are clean and well-kept, changing face and chest skins when necessary.
- Ask participants to read the section "Health Precautions and Guidelines During Training" in the workbook for the Red Cross course on responding to emergencies before using the manikins.
- Demonstrate manikin decontamination procedures before participants use the manikins.
- Be consistent in following the guidelines to clean manikins during and after classes, even if face shields and face and lung assemblies designed for individual use are used.
- Keep the mouths and noses of manikins covered with a clean cloth or towel when not working with them.
- Offer participants protective barriers, such as face shields, to help them avoid direct mouth-to-manikin contact.

BASIC: First, instructors can make sure participants know that HIV (the virus that causes AIDS) is spread through sexual and blood-to-blood contact. Instructors can then conduct their classes in ways that reassure participants that the manikins are clean and well-kept.

Sources: American Red Cross. *Responding to Emergencies Instructor's Manual.* 1996.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

Can I get AIDS from a CPR manikin?

BASIC: There is very little, if any, possibility that this could happen. According to the Centers for Disease Control and Prevention (CDC), there has never been a documented case of any infectious disease transmitted through the use of CPR manikins. The Red Cross and the American Heart Association follow widely accepted guidelines for cleaning and decontaminating manikins. Current guidelines further ensure the safety of using manikins.	DETAILED: There is very little, if any, possibility that this could happen. According to the Centers for Disease Control and Prevention (CDC), there has never been a documented case of any infectious disease transmitted through the use of CPR manikins. The Red Cross and the American Heart Association use widely accepted guidelines for cleaning and decontaminating manikins to further ensure the safety of their use. These guidelines include— • Asking participants to wash their hands well with soap and water before working with a manikin and to wash them again whenever necessary during training. • Encouraging participants to postpone CPR training if they have acute infections, such as colds, or conditions, such as sores or cuts on the hands or in or around the mouth, until the infection is cured or condition has healed. • Recommending that participants with acute or chronic infections or conditions who cannot postpone training talk with their doctors. If their doctors decide that CPR training will not put these participants at risk, a separate manikin can be requested. • Following recommended manikin cleaning procedures and having participants and instructors follow rules of personal hygiene during and after training. • Having participants use their own face shields each time they practice on the manikin. There is the potential for the tissues in and around a participant's mouth to become damaged during practice on a CPR manikin, which could cause minor bleeding. Because HIV (the virus that causes AIDS) may be transmitted through blood or saliva containing visible blood, a very low risk of HIV infection exists. Also, the recommended cleaning procedures remove or kill not only HIV, but other viruses, bacteria, and fungi.

Sources: Centers for Disease Control and Prevention. *MMWR,* 1997; vol. 46, no. 27. "Transmission of HIV Possibly Associated with Exposure of Mucous Membrane to Contaminated Blood."
American Red Cross. *Responding to Emergencies Instructor's Manual.* 1996.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."
Centers for Disease Control and Prevention. *MMWR,* 1987; vol. 36, no. 25.
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

What are the standards for decontaminating manikins?

Detailed: The Red Cross follows the standards and guidelines for decontaminating manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care for use in CPR, first aid, and water safety classes. Participants are instructed to use the following procedure to clean manikins between uses:

- Wash hands thoroughly before working with the manikin.
- Wipe its face, nose, and mouth interior vigorously with a clean, moistened cloth or a pad soaked with a fresh solution of chlorine bleach and water (one-fourth cup of liquid chlorine bleach per gallon of tap water) or a product that is 70 percent alcohol (rubbing alcohol).
- Let the surfaces remain wet for at least 30 seconds.
- Wipe dry with a clean gauze pad.
- When possible, use manikins with removable faces (one for each participant) and disposable lungs.

Instructors clean manikins immediately after training sessions to keep fluids from drying on manikin surfaces. Cleaning manikins entails—

- Wearing rubber, latex, or nitrile gloves and eye protection. Face masks approved by the National Institute for Occupational Safety and Health (NIOSH) may also need to be worn when taking apart the interiors of some manikins.
- Disassembling the manikins according to the manufacturer's instructions.
- Thoroughly washing all external and internal surfaces and reusable face shields with warm, soapy water and brushes.
- Rinsing all manikin surfaces with fresh water.
- Wetting all surfaces for 10 minutes with a fresh solution of one-fourth cup of liquid chlorine bleach per gallon of tap water. (This is a convenient measure that is close to the recommended 1:100 ratio.)
- Rinsing the manikin with fresh water and immediately drying all external and internal surfaces with clean towels. Rinsing with alcohol will help dry internal surfaces.
- Washing hands with soap and water after removing gloves.

Basic: The Red Cross follows the standards and guidelines for decontaminating manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care.

Sources: American Red Cross. *Emergency Response.* 1997.
American Red Cross. *Responding to Emergencies Instructor's Manual.* 1996.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Centers for Disease Control and Prevention. *MMWR*, 1989; vol. 38, no. S-6. "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers."
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulminary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

How do these procedures kill the AIDS virus?

Basic: HIV (the virus that causes AIDS) can be destroyed by disinfectants such as the recommended solution of chlorine bleach and water.

Detailed: HIV (the virus that causes AIDS) does not survive for long outside the body. HIV is sensitive to virtually all disinfectants. Scientists have found that as fluid containing HIV dries, 90 to 99 percent of the virus is destroyed within a few hours. Studies have shown that the virus is destroyed rapidly by a number of disinfectants, including the recommended solution of one-fourth cup of chlorine bleach to one gallon of tap water. (This is a convenient measure that is close to the recommended 1:100 ratio.) This bleach solution is also effective against a wide variety of bacteria and fungi, as well as other viruses.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment, and Prevention,* 4th ed. 1997.
Journal of Acquired Immune Deficiency Syndromes, 1994; vol. 7, no. 2. "HIV-1 and Bleach." Garza, B., et al.
Centers for Disease Control and Prevention. *National AIDS Hotline Training Bulletin,* March 30, 1993; no. 38.
Centers for Disease Control and Prevention. *MMWR,* 1989; vol. 38, no. S-6. "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers."

Can I get AIDS from cleaning manikins after a CPR class?

Basic: No, not if the guidelines for decontaminating manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care are followed. These guidelines instruct people to wear rubber or latex household gloves while cleaning manikins and to wash their hands well with soap and water after removing the gloves.

Detailed: No, not if the guidelines for decontaminating manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care are followed. These guidelines instruct people to wear rubber or latex household gloves while cleaning manikins and to wash their hands well with soap and water after removing the gloves. (Some people use nitrile gloves as an alternate to latex.) The gloves serve as a barrier against germs, including HIV. Thorough hand washing is also effective against germs in case the gloves leak during use or the hands are accidentally contaminated while removing the gloves.

Sources: American Red Cross. *Emergency Response.* 1997.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

Can I get AIDS from someone in my CPR class who has it?

Detailed: HIV (the virus that causes AIDS) is not spread through everyday casual contact. If people follow the guidelines on using and cleaning manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care and the 1989 supplemental guidelines, their level of safety is very high.

Basic: HIV (the virus that causes AIDS) is not spread through everyday casual contact.

Sources:
DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment, and Prevention,* 4th ed. 1997.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."
Journal of the American Medical Association, 1988; vol. 259, no. 9. "Do Alternative Modes of Transmission of Human Immunodeficiency Virus Exist? A Review." Lifson, A.
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

Why can't I use a manikin if I'm not sick and have only a cut on my hand?
Why can't I use a manikin if I'm not sick but just have a rash?

BASIC: The first line of defense against many bloodborne infections is the skin. If people have broken skin on their hands (such as from cuts, burns, or a rash) or in and around their mouths (such as from chapped, bleeding lips), they need to wait for their skin to heal before taking a CPR class. This precaution will help protect them against infection, including HIV infection.

DETAILED: The first line of defense against many infections is the skin. The standards and guidelines adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care state that CPR instructors and participants with broken skin on their hands (such as from cuts, burns, or a rash) or in and around the mouth (such as from chapped, bleeding lips) should postpone training. These guidelines exist out of concern both for the health of people with breaks in their skin and for the safety of others.

Supplemental guidelines adopted in 1989 recommend that people with acute problems (such as a cut, burn, or chapped and bleeding lips) postpone a CPR class until their skin has healed. To accommodate participants with chronic skin conditions not in or around the mouth (such as eczema on the hands), CPR instructors may provide them with rubber, latex, or nitrile household gloves to use while practicing on a manikin. People with chronic skin conditions, however, should check with their doctors first to make sure that it is safe for them to participate.

Sources: American Red Cross. *Emergency Response.* 1997.

Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiac Care (ECC)."

Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."

Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

I know I have HIV. Can I take a CPR course in hope of receiving a course completion certificate?

DETAILED: Yes. The Red Cross believes that reasonable accommodations should be made to provide CPR training to anyone who wants it. To complete a course and obtain a completion certificate, a participant must—

- Demonstrate competency in each skill taught in the course.
- Correctly answer at least 80 percent of the questions on a written test.

Supplemental guidelines adopted by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care in 1989 state that anyone with an acute or chronic infection or with broken skin (lesions) on the hands or in or around the mouth should not participate in regular CPR training. In most cases, CPR training can be postponed until acute infections are cured or skin lesions are healed. This ensures that other CPR participants will not come into contact with germs from an acutely infected student, and that a participant with broken skin will not become infected through contact with others.

With people who have chronic infections, similar strategies are appropriate. Because people with chronic infections, including people with HIV, may be less resistant to disease, they must be protected from exposure to other germs. This is best accomplished by providing a separate manikin to participants with chronic infections. These manikins cannot be used by anyone else until they have been cleaned following recommended manikin decontamination procedures. People with chronic infections should consult their doctors to help them decide whether to participate in CPR training.

HIV is not spread through everyday casual contact. If people follow the guidelines on using and cleaning manikins adopted by the 1985 and 1992 National Conferences on Cardiopulmonary Resuscitation and Emergency Cardiac Care, and the 1989 supplemental guidelines, their level of safety is very high.

BASIC: Yes, if reasonable accommodations can be made that do not change performance standards or endanger anyone's health.

Sources: American Red Cross. *Responding to Emergencies Instructor's Manual.* 1996.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

If I don't get certified in CPR and first aid, I might lose my job. What can I do?

BASIC: Employers and employees must resolve questions about conditions of employment.

DETAILED: People need to ask their employers this question, because it involves conditions of employment. The most recent guidelines, established in 1992 by a committee made up of representatives from the American Heart Association, the Centers for Disease Control and Prevention (CDC), and the Red Cross, state that anyone with a chronic infection should not participate in CPR training unless—

- His or her doctor says that CPR training is appropriate.
- Proper safety precautions are taken for the benefit of all participants.

Also, people need to consider actually performing CPR on a victim. Doing CPR may expose people with HIV to other infections, which their weakened immune systems might be unable to fight.

Red Cross certification in CPR and first aid requires that the participant complete the practice sessions, pass all the skill checks, and pass the written test with a score of 80 percent or higher. Even for employment purposes, the Red Cross cannot change its certification standards to accommodate anyone unable to meet them. In addition, successful completion of a Red Cross course does not ensure employment.

Sources: American Red Cross. *Responding to Emergencies Instructor's Manual.* 1996.
Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."
Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."
Journal of the American Medical Association, 1986; vol. 255, no. 21. "Standards and Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

I have HIV. If I do CPR on someone, can I infect that person?

DETAILED: People with chronic infections such as HIV infection need to understand that there is potential risk of spreading infection to people who receive CPR, if barrier devices are not used.

A guideline adopted by the 1992 National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care states, "Rescuers who have an infection that may be transmitted by blood or saliva should not perform mouth-to-mouth resuscitation if circumstances allow other immediate or effective methods of ventilation." (Although HIV is spread by blood, it is not spread by saliva, unless it contains visible blood.) This guideline covers the use of barriers, such as rubber, latex, or nitrile gloves; resuscitation masks (with a one-way valve); and bag-valve masks.

People can also help by calling 911 or other local emergency numbers.

BASIC: People with chronic infections such as HIV infection need to understand that there is potential risk of spreading infection to people who receive CPR, if barrier devices are not used.

Sources: American Red Cross. *Emergency Response.* 1997.

Centers for Disease Control and Prevention. *AIDS Prevention Guide.* 1994.

Journal of the American Medical Association, 1992; vol. 268, no. 16. "Disease Transmission During Actual Performance of CPR."

Journal of the American Medical Association, 1992; vol. 268, no. 16. "Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)."

Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."

Can I get AIDS if I do CPR on someone who has it?

BASIC: It is very difficult to become infected with HIV (the virus that causes AIDS). This only happens if there is sexual or blood-to-blood contact. A layperson's decision to help someone with HIV should be guided by facts and personal ethics.

DETAILED: It is very difficult to become infected with HIV (the virus that causes AIDS). The virus spreads from person to person through blood-to-blood and sexual contact. A layperson's decision to help someone with HIV should be guided by facts and personal ethics. If a person feels uncertain or unprepared to become involved, he or she can still call 911 or other local emergency numbers to get medical help.

The risk of becoming infected with HIV from performing CPR is so low that it has not been defined. There are no documented cases of HIV transmission through rescue breathing or CPR. In a study conducted by the Centers for Disease Control and Prevention (CDC), none of the 48 health care workers studied became infected from skin or mucous membrane exposure to the saliva of people with HIV. Even so, people should use barriers such as rubber, latex, or nitrile gloves and resuscitation masks (with a one-way valve) or bag-valve masks when performing CPR.

Sources: *Journal of the American Medical Association*, 1992; vol. 268, no. 16. "Disease Transmission During Actual Performance of CPR."

Journal of the American Medical Association, 1989; vol. 262, no. 19. "Risk of Infection During CPR Training and Rescue: Supplemental Guidelines."

Centers for Disease Control and Prevention. *MMWR*, 1988; vol. 37, no. 24. "Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and Other Bloodborne Pathogens in Health-Care Settings."

Centers for Disease Control and Prevention. *MMWR*, 1987; vol. 36, no. 2S. "Recommendations for Prevention of HIV Transmission in Health-Care Settings."

Should I help a bleeding person if I think this person does things that expose him or her to AIDS?

Detailed: Personal, moral, and ethical considerations, not legal ones, guide a layperson's decision to help in an emergency. People who give first aid need to understand potential risks. People usually do not know the health status of a person they are helping.

People who decide to help someone who is sick or injured should follow basic precautions. Besides other safety considerations, such as confronting fire, poisonous fumes, and downed electrical wires, people must consider the risk of disease transmission if there is possible exposure to a victim's body fluids. People can use caution to avoid exposure to hazards at the scene of an emergency. Rubber, latex, vinyl, or nitrile gloves should be worn for protection against germs. Skin helps protect people when they give first aid; people should avoid direct contact with a victim's blood. Thoroughly washing hands and other skin surfaces that may have been exposed is important, even if gloves or other protective barriers were used.

A person's risk of becoming infected with HIV (the virus that causes AIDS) from touching someone's blood depends on all of these conditions:

- The person who is bleeding must be infected with HIV.
- The person who is helping must have breaks in the skin or their mucous membranes in the mouth or eyes and must be exposed to the infected blood.
- There must be enough blood with HIV to cause infection.

If people feel uncomfortable with giving first aid, they can still call 911 or other local emergency numbers to get medical help.

Basic: Personal, moral, and ethical considerations, not legal ones, guide a layperson's decision to help in an emergency. A person who gives first aid needs to understand potential risks. Besides other safety considerations, such as confronting fire, poisonous fumes, and downed electrical wires, people must consider the risk of disease transmission if there is possible exposure to an injured person's body fluids. People need to use caution to avoid exposure to hazards at the scene of an accident. Skin and the use of rubber, latex, vinyl, or nitrile gloves help protect people from disease transmission when they give first aid. People must avoid direct contact with an injured person's blood. Thoroughly washing hands and other skin surfaces that may have been exposed after giving first aid is important, even if people used gloves or other protective barriers. If people feel uncomfortable with giving first aid, they can still call 911 or other local emergency numbers to get medical help.

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I'm on the first aid team at work. My husband has been after me to quit because he's afraid I'll get AIDS. Is this possible?

BASIC: There is a need for trained people who can respond to emergencies. Rather than quitting, people can learn the facts about HIV (the virus that causes AIDS) and follow basic precautions.

DETAILED: There is a need for trained people who can respond to emergencies. Rather than quitting, people can learn the facts about HIV (the virus that causes AIDS).

People must use caution at the scene of an emergency to avoid exposure to hazards. Besides safety considerations such as confronting fire, poisonous fumes, and downed electrical wires, people must consider the risk of disease transmission if there is possible exposure to body fluids. Rubber, vinyl, latex, or nitrile gloves, eye protection, and respiratory protection (masks) approved by the National Institute for Occupational Safety and Health (NIOSH) are recommended for people who respond to emergencies. It is important that—

- People make sure that their employers supply them with adequate protective barriers at the worksite and that they know how to use them correctly.
- People give first aid in ways that protect themselves and the victim from disease transmission. They can use protective barriers such as gloves, eye protection, and respiratory protection (masks) approved by NIOSH that are appropriate to the emergency. Washing hands thoroughly with soap and water after removing gloves is very important.

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Can I get AIDS from a swimming pool?
Can I get AIDS from a spa?
Can I get AIDS from a hot tub?

DETAILED: No. HIV (the virus that causes AIDS) is spread through blood, semen, vaginal fluid, or breast milk. If contaminated blood, semen, vaginal fluid, or breast milk get into a swimming pool, spa, or hot tub, properly maintained filters and balanced pool treatment chemicals either remove or inactivate these body fluids. There is essentially no risk, therefore, in using these facilities. In addition, HIV does not survive for long outside the human body.

BASIC: No. If contaminated blood, semen, vaginal fluid, or breast milk get into in a swimming pool, spa, or hot tub, properly maintained filters and balanced pool treatment chemicals either remove or inactivate these body fluids.

Sources: Centers for Disease Control and Prevention. "Facts about the Human Immunodeficiency Virus and Its Transmission." July 1997.
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I'm a lifeguard. What if someone who nearly drowned vomits while I'm doing rescue breathing? Could I get AIDS?

DETAILED: It is very unlikely. Although victims of near drowning might vomit as people do rescue breathing, all the following conditions would have to occur for the rescuer to become infected with HIV (the virus that causes AIDS):

- The victim has to be infected with HIV.
- The victim has to vomit.
- The vomit has to contain blood.
- Blood from the vomit has to enter the body in quantities sufficient to infect the rescuer. This is highly unlikely.

Many lifeguards, as people who have a legal duty to respond to emergencies, use resuscitation masks and gloves as barriers against disease transmission when giving rescue breathing. People who have this equipment need to know how to use it properly and to have it readily available. Lifeguards, along with other people who respond to emergencies, can protect themselves from bloodborne germs such as HIV and hepatitis B by following universal precautions.

BASIC: It is very unlikely.

Sources: DeVita, V., Jr., et al., eds. *AIDS: Etiology, Diagnosis, Treatment, and Prevention,* 4th ed. 1997.
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Glossary

Acquired immunodeficiency syndrome (AIDS): A result of human immunodeficiency virus (HIV) infection, which makes the immune system less able to fight infection.

AIDS: *See* acquired immunodeficiency syndrome.

AIDS clinical trial groups: Federally funded, randomized clinical trials for new AIDS drugs directed by the National Institutes of Health (NIH).

AIDS-related complex (ARC): An outdated term used to describe symptoms of infection in people with HIV who had not yet developed AIDS.

Alternative therapies: Nonmedical approaches that some people believe to be effective in treating HIV infection, including acupuncture, visualization, crystals, natural products, and macrobiotics.

Ambiguous test results: Results that are neither clearly negative nor clearly positive. Used here to describe HIV antibody test results in which the EIA shows the presence of HIV antibodies but the Western blot does not. To allow detectable antibodies to develop, a person whose test results are ambiguous should be retested within three months of possible exposure to HIV. The average time needed to detect HIV antibodies is 25 days.

Anal sex (also **anal intercourse**): Penetration of the anus by the penis or other objects.

Anonymous testing: Testing in which no information that identifies a person is recorded. Only the person tested can obtain the results.

Antibody: A substance in the blood that forms when disease agents such as viruses, bacteria, fungi, and parasites invade the body. Although antibodies usually defend the body against invading disease agents, HIV antibodies, over time, give no such protection.

Antibody-negative test result: Used here to describe the results of a test in which no signs of antibodies to HIV are detected in the blood or in fluids from the mouth. Either the person does not have HIV or became infected with HIV too recently to have detectable antibodies.

Antibody-positive test result: Used here to describe the results of a test in which antibodies to HIV are detected in the blood or in fluids from the mouth. A person is assumed to be infected with HIV if the results of both the EIA and Western blot tests are positive.

Antigen test: A blood test that looks for a part of HIV rather than for antibodies to HIV. For a short period of time, this test detects HIV in people who were recently infected but do not yet have detectable antibodies. To further protect the blood supply, the Food and Drug Administration (FDA) added this test in 1996, as an interim measure, to the tests for HIV antibodies in place since 1985.

Antiviral drugs: Drugs that slow the pace of HIV infection by suppressing the ability of HIV to replicate.

ARC: *See* AIDS-related complex.

Glossary

Autologous blood donation: Blood that people donate for their own use, usually for nonemergency surgery.

Bacteria: Microscopic organisms that can cause disease.

Bacterial infections: Diseases that bacteria cause, such as syphilis. Most respond to antibiotic treatment.

B-cell: A type of white blood cell that makes antibodies against germs that have invaded the body.

Bisexual: A person who has sexual partners of the same sex and of the opposite sex.

Bloodborne disease: An infection carried in the bloodstream, such as HIV infection and hepatitis B infection.

Blood clotting factors: Substances in the blood that cause it to thicken. Used to treat hemophilia.

Blood components: Parts of the blood, including formed elements (white blood cells, red blood cells, and platelets) and liquid (plasma), that contain proteins used to make clotting factors.

Blood-to-blood contact: The mixing together of blood from two or more people. The primary ways HIV is spread through blood-to-blood contact are the use of shared needles and syringes; blood transfusions, receipt of blood components or clotting factors, and organ transplants (all rare since 1985); and transmission from mother to child during birth.

Body defenses: *See* immune system.

Body substance isolation: Guidelines that protect health care workers and patients from exposure to HIV, hepatitis B, and other bloodborne germs, as well as germs spread in other ways.

Candidiasis: A fungal infection that occurs in several places in the body, including in the mouth or throat (thrush), in the vagina (yeast infections), or on the skin. A common opportunistic infection in people with AIDS.

Casual contact: Ordinary social contact, such as being around someone; sharing utensils, office space, bathrooms, phones, and swimming pools; shaking hands; and kissing on the cheek. People cannot get HIV from casual contact.

CD4+ cell: See T-cell.

Centers for Disease Control and Prevention (CDC): A federal disease prevention agency, which is part of the U.S. Department of Health and Human Services, that provides national laboratory and health and safety guidelines and recommendations; tracks diseases throughout the world; and performs basic research involving laboratory, behavioral science, epidemiology, and other studies of diseases.

Chlamydia: A sexually transmitted disease (STD) that may cause a discharge from the penis or vagina, painful urination, spotting of blood after sex (in women only), and lower abdominal pain.

Chronic: Used here to describe a prolonged, lingering, or recurring state of disease.

Clade: Used here to describe a group or a member of the "family" of HIV. HIV-1 group O is a clade.

CMV: *See* cytomegalovirus infection.

Combination therapy: Treatments, sometimes called "drug cocktails," involving a combination of three antiviral drugs that can dramatically inhibit HIV replication.

Condom: A sheath, made of latex, polyurethane, or lamb intestine, that fits over an erect penis. When used correctly and consistently, *latex* condoms have been shown to greatly reduce the risk of HIV infection. Female condoms are also available to use when male condoms cannot be used.

Confidential testing: Testing in which results are recorded, but are not given out without permission of the person tested, except as required by state law.

Confidentiality: Used here to describe keeping medical information confidential or private.

Connective tissue: Tissue that supports and binds other tissues and organs. Frequently the site of Kaposi's sarcoma lesions in people with AIDS.

Contaminated needles: Needles that have been used by someone and not properly cleaned. People can become infected with HIV by using a needle and syringe that contains blood from a person who has HIV.

Crack: A form of cocaine that is smoked.

Crack house: A place where crack is bought and used.

Cryptococcosis: A fungal infection that can cause pneumonia or meningitis with inflammation of the brain.

Cytomegalovirus (CMV) infection: A viral infection that may occur without symptoms or that may cause mild flu-like symptoms. A common opportunistic infection among people with AIDS, which can cause blindness.

Dendritic cells: A type of white blood cell essential to the body's immune system. These cells carry germs from the point of infection to the lymph nodes and trigger T-cell response to fight infection.

Dental dams: Made for dentistry, some people use these during oral sex as a barrier between a person's mouth and a partner's vagina or anus. No scientific studies have been done on their use in this way.

Designated blood donation: Blood donated by a family member or friend for a specific person's use.

Developed immunity: Protection the body develops against infection by a particular germ. Scientists consider it unlikely for a person to develop immunity to HIV.

Disinfectant: A chemical that destroys germs. An example is liquid chlorine bleach, which can be used to clean needles and syringes so that they are less likely to spread HIV if they are shared.

DNA (deoxyribonucleic acid): The chain of molecules in genes, which carries genetic information that helps cells reproduce. DNA is the main ingredient of chromosomes, which transmit genetic information.

Dot-blot immunobinding assay: A rapid-screening blood test that is cost-effective and may become an alternative to conventional EIA and Western blot testing.

EIA (enzyme immunoassay): A standard test used to detect the presence of HIV. When an EIA detects antibodies to HIV, the result must be confirmed by the Western blot test or immunofluorescence assay (IFA) before a person is considered to have HIV. Formerly referred to as ELISA.

Ejaculate: To eject semen; the semen released by ejaculation during orgasm.

ELISA: *See* EIA.

Enzyme: A cellular protein that acts as a catalyst to induce chemical changes or reactions in other substances, with little expenditure of energy. The enzyme remains unchanged by the process.

Experimental drug: A drug in the process of scientific testing but not yet approved by the Food and Drug Administration (FDA) for general use.

False-negative test result: Used here to describe the results of a test for HIV antibodies that do not show the presence of HIV even though the sample of blood or fluid from the mouth contains the virus. Usually found in people who were recently infected with HIV but who do not yet have detectable antibodies.

False-positive test result: Used here to describe the results of a test for HIV antibodies that do show the presence of HIV even though the sample of blood or fluid from the mouth does not contain HIV.

FDA: *See* Food and Drug Administration.

Female condom: A tube made of polyurethane, with a ring at each end, that lines the vagina and covers part of the labia. Although research on its effectiveness against sexually transmitted diseases (STDs) including HIV infection is encouraging, further study is needed.

Food and Drug Administration (FDA): A federal agency with several regulatory functions, including testing and approving new drugs before they are made available to the public.

Fungi: A type of microscopic germ, including yeast and mold.

Gay: Being romantically or sexually attracted to people of one's own sex.

Genetic: Refers to the gene, a part of a chromosome, which controls heredity. Genes determine how people function and what traits they pass on to their children.

Genital contact: Contact between the sexual organs of people.

Genital warts: A sexually transmitted disease (STD), caused by human papilloma virus, that may cause warts on the outside of the genitals, anus, or mouth.

Genome: Used here to refer to the genetic information of HIV and other viruses.

Germs: Viruses, bacteria, fungi, and parasites that carry infection.

Gonorrhea: A sexually transmitted disease (STD) that may cause a discharge from the penis or vagina, painful urination, spotting of blood after sex (in women only), and lower abdominal pain.

Hemophilia: A hereditary blood disorder that prevents blood from clotting properly.

Hepatitis B: A virus that attacks the liver and is transmitted through blood-to-blood and sexual contact.

Herpes: Short for herpes simplex viruses, which cause painful, fluid-filled blisters around the mouth or genitals. A common infection in people with AIDS.

Heterosexual: Being romantically or sexually attracted to people of the opposite sex.

HIV: *See* human immunodeficiency virus.

HIVNET: A program that conducts large-scale clinical trials on HIV vaccines and other prevention strategies in the United States and elsewhere.

Homosexual: *See* gay.

Host: Used here to describe where a germ lives. For example, a person who has HIV is the host for the virus.

Household contact: Everyday casual contact among members of a household.

HTLV-III: *See* human T-cell lymphotropic virus-III.

Human immunodeficiency virus (HIV): The virus that causes AIDS. HIV weakens several body systems and destroys the body's immune system, making it easier for life-threatening opportunistic infections and cancers to invade the body.

Human T-cell lymphotropic virus-III (HTLV-III): An earlier term for human immunodeficiency virus (HIV), the cause of AIDS.

Immune: The state of being protected from disease.

Immune system: A system of the body that helps it resist germs.

Immunization: A method to trigger the body's defenses against diseases, such as rubella and polio.

Immunofluorescence assay (IFA): A blood test that detects antibodies to HIV. Used to confirm EIA results.

Immunoglobulin: A class of antibodies that protects the body against germs. Commonly used to treat children with AIDS.

Incidence: The number or rate of new cases of a disease over a period of time.

Incubation: Used here to describe the period from the point of infection with HIV to the onset of symptoms of AIDS.

Indeterminate test results: *See* ambiguous test results.

Infectious disease: A disease that is caused by or can be transmitted by germs. Not all diseases are highly contagious (easily transmitted to other people). For example, HIV is highly infectious, but it is not easily or casually transmitted.

Injection drug use: The use of a needle and syringe to inject drugs into the body.

IV drug use: *See* injection drug use.

Kaposi's sarcoma: A cancer that usually involves the skin, mucous membranes, and lymph nodes. Ordinarily appearing first on the legs or arms, this disease affects people with AIDS more than it does other people.

LAV: *See* lymphadenopathy-associated virus.

Lesbian: A woman who is romantically or sexually attracted to other women.

Lesion: An abnormal change in the tissue or structure of an organ or body part due to injury or disease.

Long-term nonprogressors: Used here to describe people with HIV whose bodies have effectively resisted HIV for more than seven years.

Lubricant: Used here to describe a substance used to reduce friction during sex.

Lymphadenopathy-associated virus (LAV): An earlier name for human immunodeficiency virus (HIV), the virus that causes AIDS.

Lymph glands: Glands in the groin, neck, armpits, and other parts of the body that contain large numbers of lymphocytes that help fight infection.

Lymphocytes: Certain types of white blood cells—T-cells and B-cells—essential to the function of the immune system.

Macrophage: A type of white blood cell that surrounds and devours infected cells, germs, and dead material. *See* monocyte.

Mandatory testing: Required testing of a population or group of people. Traditionally used only for diseases that have cures or effective treatments.

Masturbation: Massaging one's own genitals, often to the point of orgasm.

Medicaid: A federal and state health insurance program that pays certain medical expenses for people whose incomes fall below the poverty level, as set by each state.

Medicare: A federal health insurance program that pays certain medical expenses for people who are disabled, 65 or older, or have chronic kidney disease.

Meningitis: Infection and inflammation of the membranes that cover the brain and spinal cord.

Monocyte: A young macrophage, a type of white blood cell. *See* macrophage.

Monogamy: Having sex with only one partner. Describes an HIV prevention strategy in which two people, who do not have HIV or inject drugs, have sex only with each other over a period of time.

Motor function: The ability to move. People with AIDS often become less able to perform certain tasks or movements because they have become weak or because HIV has affected their nervous systems.

Mucous membrane: A lining or membrane of all body passages that have an outside opening, such as the mouth and vagina. The glands in the mucous membrane produce mucus.

Multi-drug-resistant tuberculosis: A form of tuberculosis (TB) that occurs when TB becomes resistant to the drugs used to treat it.

Mutual masturbation: Massaging a partner's genitals, often to the point of orgasm. *See* masturbation.

***Mycobacterium avium* complex (MAC):** A disease caused by mycobacteria. Appears in people whose immune systems are badly damaged and causes fever, weight loss, weakness, and sometimes diarrhea.

National Institutes of Health (NIH): An agency of the U.S. Department of Health and Human Services that supports and conducts biomedical and health research, trains scientists and doctors, and writes and publishes scientific and medical reports.

Natural condoms: Condoms made from the intestinal lining of sheep. Adequate for birth control, but not for disease prevention.

Needle exchanges: Programs that provide injection drug users with new, sterile needles and syringes to reduce the spread of HIV from shared equipment. Research has shown that these controversial programs do not increase drug use or reduce demand for drug treatment.

Needle stick (also **needle stab, needle jab**): A needle puncture of the skin, usually accidental. A very infrequent way that health care workers become infected with HIV on the job.

Negative test results: Used here to describe results of a test in which no signs of HIV are detected.

Non-nucleoside reverse transcriptase inhibitor: A type of antiviral drug that blocks HIV replication by binding with reverse transcriptase, a viral protein.

Nonoxynol-9: A chemical (spermicide) used in some contraceptive creams, foams, and jellies that kills sperm and that may kill viruses.

Nucleoside analogue: A type of antiviral drug that suppresses replication of HIV by interfering with the construction of a chain of DNA as HIV infects a new cell.

Occupational Safety and Health Administration (OSHA): A federal agency responsible for protecting the safety and health of workers through regulations, including those on occupational exposure to bloodborne germs.

Opportunistic infections: A variety of infections, such as *Pneumocystis carinii* pneumonia, that occur in people whose immune systems are weak for various reasons, including disease, such as HIV infection.

Oral sex: Contact of the mouth or tongue with a partner's penis, vagina, or anus.

p24 antigen capture assay: *See* antigen test.

p24 antigen test: *See* antigen test.

Parallel track: A program to make experimental drugs more widely available to people who have advanced HIV infection and who have no other drug alternatives.

Parasite: An organism that relies on another organism for survival.

Parenteral transmission of HIV: The injection of HIV into the body, most commonly through HIV-contaminated needles and syringes.

Partner notification: The process of letting sex and needle-sharing partners of an HIV-infected person know that they may be at risk of having HIV.

Perinatal transmission of HIV: Term used to describe the spread of HIV from a mother to her baby before or during birth.

Placenta: A blood-filled organ that serves as a source of nutrition for the baby during pregnancy. HIV may spread across the placenta from a mother with HIV to her baby.

***Pneumocystis carinii* pneumonia:** A form of pneumonia, which is caused by a fungus, that rarely affects people with fully functioning immune systems. Still the most common opportunistic infection among people with AIDS in the United States.

Pneumonia: An infection of the lungs.

Polymerase chain reaction (PCR) test: A test that detects HIV by looking for the genetic information of the virus. This test can find HIV even if it is present in very small amounts or hidden inside white blood cells.

Positive test results: Used here to describe results of a test in which signs of HIV are detected. A person with a positive test result is assumed to be infected with HIV and able to infect others.

Post-exposure prophylaxis: Used here to describe treatment taken as a precaution against HIV infection after a person has been exposed to HIV, usually on the job.

Prevalence: Total number of cases of a disease in a population over a period of time.

Protease inhibitors: A new class of antiviral drugs. These drugs suppress HIV by blocking infected cells from making copies of HIV, which are capable of infecting other cells.

Quarantine: Isolation of a person with a contagious disease.

Radioimmunoprecipitation assay (RIPA): A confirmatory blood test used when antibody levels are very low or difficult to detect or when Western blot test results are ambiguous.

Rapid latex agglutination assay: A simple, inexpensive blood test that may prove useful in medically disadvantaged areas that have a high incidence of HIV infection.

Replicate: Used here to describe the ability of HIV to make copies of itself.

Risk behavior: Used here to describe activities that put people at increased risk of getting HIV.

Risk group: For statistical purposes, a collection of people thought to have something in common that puts them at risk of getting a disease.

RNA (ribonucleic acid): A nucleic acid found in the contents of a cell surrounding the nucleus. Some retroviruses, such as HIV, carry RNA instead of the more usual DNA.

Safer sex: Sexual practices that involve no exchange of blood, semen, or vaginal fluid.

Semen: Whitish fluid containing sperm and white blood cells, which is ejaculated from the penis during orgasm. HIV can be spread through semen that is infected.

Seroconversion: Used here to describe the change from an absence of antibodies to HIV in the blood to the presence of HIV antibodies in the blood of an HIV-infected person.

Sex (also **sexual intercourse**): Genital contact between individuals and contact with a partner's vagina, penis, or anus.

Sexual orientation: The sexual attraction people feel for others, whether of their own sex, the opposite sex, or both sexes.

Sexually transmitted disease (STD): A disease that spreads during sex, through genital contact between people, such as gonorrhea, syphilis, herpes, and HIV infection.

Shingles: An inflammation of nerve endings caused by the virus that causes chicken pox. An opportunistic infection common among people with AIDS.

Shooting galleries: Used here to describe places where drugs, particularly injection drugs, are sold and used.

SIV (simian immunodeficiency virus): A virus similar to HIV that infects monkeys and other primates in West and Central Africa.

Speedball: Heroin mixed with amphetamines (speed) or cocaine.

Sperm bank: A storage facility for sperm used in artificial insemination.

Spermicide: A chemical (for example, nonoxynol-9) usually found in the form of a foam, cream, or jelly that kills sperm on contact.

SSDI (Social Security Disability Insurance): Insurance provided by the federal government to people who become disabled. The amount of payment is determined by the amount of money a person has paid into the Social Security system.

SSI (Supplemental Security Income): A Social Security program for people who are disabled, elderly, or blind. Some benefits or temporary benefits under this program may be available to people with HIV.

Standard precautions: Guidelines that combine universal precautions and body substance isolation procedures in hospitals.

STD: *See* sexually transmitted disease.

Stigma: A mark of shame or discredit, whether visible or not, that sets people apart from others.

Syndrome: Used here to describe a group of related medical problems or symptoms.

Syphilis: A sexually transmitted disease (STD) that causes sores on the genitals and, if untreated, can lead to heart and brain damage.

Systemic herpes: A sexually transmitted disease (STD) that causes sores especially on the genitals, in the anus, and in the mouth, which heal very slowly.

T-cell: A type of white blood cell essential to the body's immune system. Helps regulate the immune system and control B-cell and macrophage functions.

T-cell count (CD4+): A marker that measures the effect of HIV infection on a person's immune system.

Terry Beirn Community Programs for Clinical Research on AIDS: Community-based programs in which physicians do research on HIV infection in areas where clinical trials are not usually available.

Test sensitivity: The likelihood that HIV-infected people will test positive for the virus.

Test specificity: The likelihood that people who are not infected with HIV will test negative for the virus.

T-helper cell: *See* T-cell.

Thrush: *See* candidiasis.

T-lymphocyte: *See* T-cell.

Transfusion: The use of donated blood in a medical procedure.

Transplant: The transfer of an organ or tissue from one person to another.

Treatment Investigational New Drug (IND) Program: Gives patients with life-threatening illnesses access to experimental drugs and vaccines.

Trichomoniasis: A sexually transmitted disease (STD) that can cause a discharge from the penis or vagina, pain when urinating and when having sex, or itching.

Tuberculosis (TB): A contagious disease that primarily affects the lungs. Common among people with AIDS.

Tuskegee Study: A syphilis study begun in the 1930s by the Public Health Service in which African American men were never told they had syphilis nor were treated with antibiotics when these became available.

Universal precautions: Guidelines used by health care providers to help protect them against bloodborne germs, such as HIV infection.

Vaccine: A substance made from modified or denatured viruses or bacteria that helps protect people against a particular disease.

Vaginal fluid: Fluid that provides moisture and lubrication in the vagina. Vaginal fluid of an HIV-infected woman can spread HIV.

Vaginal sex (also **vaginal intercourse**): Sex in which the vagina is penetrated; for example, by a penis or sex toy.

Viral load: The amount of HIV RNA in the blood. As viral load increases, the chance of illness increases.

Viral load test: A marker that measures the amount of HIV RNA in the blood. Used by doctors to help make decisions about treatment. The lower the viral load, the longer a person with HIV has before developing AIDS and the longer his or her survival time.

Virus: A germ, much smaller than a bacterium, whose survival depends on cells in the host. A virus, such as HIV, often destroys these cells.

Wasting syndrome: The extreme weight loss (more than 10 percent of body weight) that often affects people with AIDS.

Western blot: A blood test that detects antibodies to HIV. Used to confirm EIA results.

White blood cells: A type of blood cell, such as a T-cell, B-cell, macrophage, and monocyte, whose primary function is to fight infection. White blood cells are the main target of HIV.

Works: Used here to describe needles, syringes, and other equipment used to "cook" or prepare and inject street drugs.

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NIAID
National Institute of Allergy and Infectious Diseases
National Institutes of Health

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How HIV Causes AIDS

An important focus of the National Institute of Allergy and Infectious Diseases (NIAID) is research devoted to the pathogenesis of human immunodeficiency virus (HIV) disease – the complex mechanisms that result in the destruction of the immune system of an HIV-infected person. A detailed understanding of HIV and how it establishes infection and causes the acquired immunodeficiency syndrome (AIDS) is crucial to identifying and developing effective drugs and vaccines to fight HIV and AIDS. This fact sheet summarizes what scientists are learning about this process and provides a brief glossary of terms.

Overview

HIV disease is characterized by a gradual deterioration of immune function. Most notably, crucial immune cells called CD4+ T cells are disabled and killed during the typical course of infection. These cells, sometimes called "T-helper cells," play a central role in the immune response, signalling other cells in the immune system to perform their special functions.

A healthy, uninfected person usually has 800 to 1,200 CD4+ T cells per cubic millimeter (mm^3) of blood. During HIV infection, the number of these cells in a person's blood progressively declines. When a person's CD4+ T cell count falls below $200/mm^3$, he or she becomes particularly vulnerable to the opportunistic infections and cancers that typify AIDS, the end stage of HIV disease. People with AIDS often suffer infections of the intestinal tract, lungs, brain, eyes and other organs, as well as debilitating weight loss, diarrhea, neurologic conditions and cancers such as Kaposi's sarcoma and lymphomas.

Most scientists think that HIV causes AIDS by directly killing CD4+ T cells or interfering with their normal function, and by triggering other events that weaken a person's immune function. For example, the network of signalling molecules that normally regulates a person's immune response is disrupted during HIV disease, impairing a person's ability to fight other infections. The HIV-mediated destruction of the lymph nodes and related immunologic organs also plays a major role in causing the immunosuppression seen in people with AIDS.

Scope of the HIV Epidemic

Although HIV was first identified in 1983, studies of previously stored blood samples indicate that the virus entered the U.S. population sometime in the late 1970s. In the United States, 612,078 cases of AIDS, and 379,258 deaths among people with AIDS had been reported to the Centers for Disease Control and Prevention (CDC) as of June 30, 1997. AIDS is now the second leading killer of people aged 25 to 44 in this country. Despite an overall stabilization in the number of new AIDS cases in this country, the epidemic continues to accelerate in certain segments of the population, notably among women and injection drug users.

Worldwide, an estimated 30.6 million people were living with HIV/AIDS as of December 1997, a figure that is projected to reach 40 million by the year 2000. More than 75 percent of all adult HIV infections have resulted from heterosexual intercourse. Through 1997, cumulative HIV/AIDS-associated deaths worldwide numbered approximately 11.7 million – 9 million adults and 2.7 million children.

HIV is a Retrovirus

HIV belongs to a class of viruses called retroviruses, which have genes composed of ribonucleic acid (RNA) molecules. The genes of humans and most other organisms are made of a related molecule, deoxyribonucleic acid (DNA).

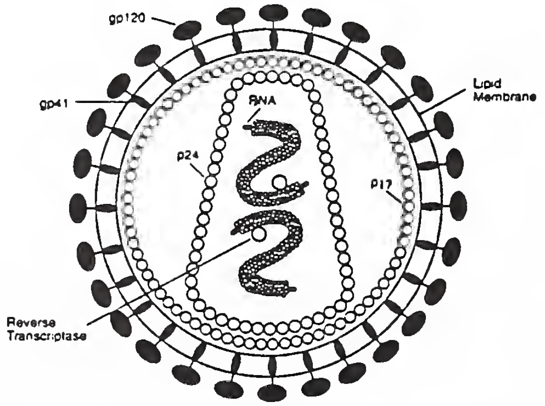
Like all viruses, HIV can replicate only inside cells, commandeering the cell's machinery to reproduce. However, only HIV and other retroviruses, once inside a cell, use an enzyme called reverse transcriptase to convert their RNA into DNA, which can be incorporated into the host cell's genes.

Slow viruses. HIV belongs to a subgroup of retroviruses known as lentiviruses, or "slow" viruses. The course of infection with these viruses is characterized by a long interval between initial infection and the onset of serious symptoms.

Other lentiviruses infect nonhuman species. For example, the feline immunodeficiency virus (FIV) infects cats and the simian immunodeficiency virus (SIV) infects monkeys and other nonhuman primates. Like HIV in humans, these animal viruses primarily infect immune system cells, often causing immunodeficiency and AIDS-like symptoms. These viruses and their hosts have provided researchers with useful, albeit imperfect, models of the HIV disease process in people.

Structure of HIV

Organization of the HIV-1 Virion



The viral envelope. HIV has a diameter of 1/10,000 of a millimeter and is spherical in shape. The outer coat of the virus, known as the viral envelope, is composed of two layers of fatty molecules called lipids, taken from the membrane of a human cell when a newly formed virus particle buds from the cell.

Embedded in the viral envelope are proteins from the host cell, as well as 72 copies (on average) of a complex HIV protein that protrudes from the envelope surface. This protein, known as Env, consists of a cap made of three or four molecules called glycoprotein (gp)120, and a stem consisting of three or four gp41 molecules that anchor the structure in the viral envelope. Much of the research to develop a vaccine against HIV has focused on these envelope proteins.

The viral core. Within the envelope of a mature HIV particle is a bullet-shaped core or capsid, made of 2000 copies of another viral protein, p24. The capsid surrounds two single strands of HIV RNA, each of which has a copy of the virus's nine genes. Three of these, *gag*, *pol* and *env*, contain information needed to make structural proteins for new virus particles. The *env* gene, for example, codes for a protein called gp160 that is broken down by a viral enzyme to form gp120 and gp41, the components of Env.

Three regulatory genes, *tat*, *rev* and *nef*, and three auxiliary genes, *vif*, *vpr* and *vpu*, contain information necessary for the production of proteins that control the ability of HIV to infect a cell, produce new copies of virus or cause disease. The protein encoded by *nef*, for instance, appears necessary for the virus to replicate efficiently, and the *vpu*-encoded protein influences the release of new virus particles from infected cells.

The ends of each strand of HIV RNA contain an RNA sequence called the long terminal repeat (LTR). Regions in the LTR act as switches to control production of new viruses and can be triggered by proteins from either HIV or the host cell.

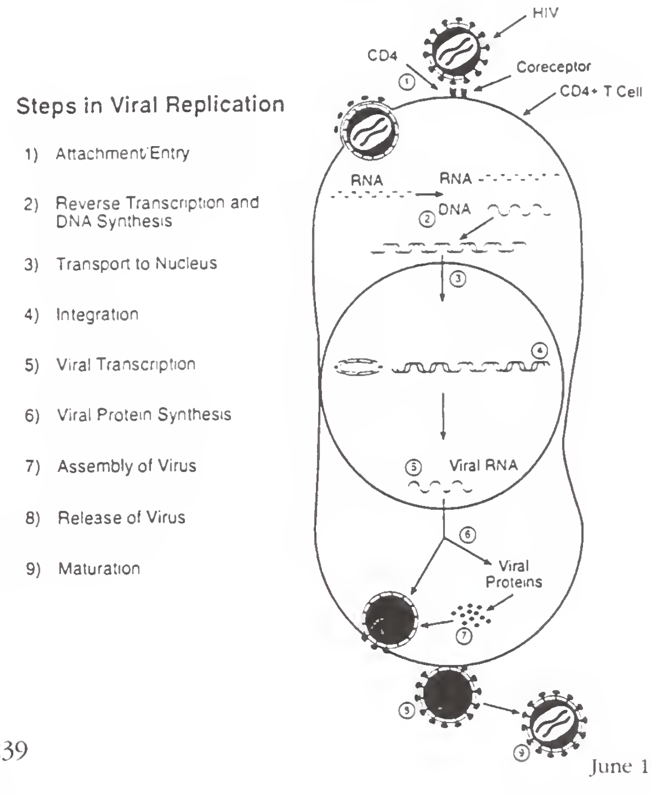
The core of HIV also includes a protein called p7, the HIV nucleocapsid protein; and three enzymes that carry out later steps in the virus's life cycle: reverse transcriptase, integrase and protease. Another HIV protein called p17, or the HIV matrix protein, lies between the viral core and the viral envelope.

Replication Cycle of HIV

Entry of HIV into cells. Infection typically begins when an HIV particle, which contains two copies of the HIV RNA, encounters a cell with a surface molecule called cluster designation 4 (CD4). Cells with this molecule are known as CD4 positive (CD4+) cells.

One or more of the virus's gp120 molecules binds tightly to CD4 molecule(s) on the cell's surface. The membranes of the virus and the cell fuse, a process that probably involves the envelope of HIV and a second "coreceptor" molecule on the cell surface. Following fusion, the virus's RNA, proteins and enzymes are released into the cell.

Life Cycle of HIV



Recent studies by NIAID intramural and extramural researchers have identified multiple coreceptors for different types of HIV strains; these coreceptors are promising targets for new anti-HIV drugs. In the early stage of HIV disease, most people harbor viruses that use, in addition to CD4, a receptor called CCR5 to enter their target cells. With disease progression, the spectrum of coreceptor usage expands to include others, notably a molecule called CXCR4.

Although CD4+ T cells appear to be HIV's main target, other immune system cells with CD4 molecules on their surfaces are infected as well. Among these are long-lived cells called monocytes and macrophages, which apparently can harbor large quantities of the virus without being killed, thus acting as reservoirs of HIV. CD4+ T cells also serve as important reservoirs of HIV: a small proportion of these cells harbor HIV in a stable, inactive form. Normal immune processes may activate these cells, resulting in the production of new HIV virions.

Cell-to-cell spread of HIV also can occur through the CD4-mediated fusion of an infected cell with an uninfected cell.

Reverse transcription. In the cytoplasm of the cell, HIV reverse transcriptase converts viral RNA into DNA, the nucleic acid form in which the cell carries its genes. Seven of the 11 antiviral drugs approved in the United States for the treatment of people with HIV infection – AZT, ddC, ddI, d4T, 3TC nevirapine and delavirdine – work by interfering with this stage of the viral life cycle.

Integration. The newly made HIV DNA moves to the cell's nucleus, where it is spliced into the host's DNA with the help of HIV integrase. Once incorporated into the cell's genes, HIV DNA is called a "provirus." Integrase is an important target for the development of new drugs.

Transcription. For a provirus to produce new viruses, RNA copies must be made that can be read by the host cell's protein-making machinery. These copies are called messenger RNA (mRNA), and production of mRNA is called transcription, a process that involves the host cell's own enzymes. Viral genes in concert with the cellular machinery control this process: the *tat* gene, for example, encodes a protein that accelerates transcription.

Cytokines, proteins involved in the normal regulation of the immune response, also may regulate transcription. Molecules such as tumor necrosis factor (TNF)-alpha and interleukin (IL)-6, secreted in elevated levels by the cells of HIV-infected people, may help to activate HIV proviruses. Other infections, by organisms such as *Mycobacterium tuberculosis*, may also enhance transcription.

Translation. After HIV mRNA is processed in the cell's nucleus, it is transported to the cytoplasm. HIV proteins are critical to this process: for example, a protein encoded by the *rev* gene allows mRNA encoding HIV structural proteins to be transferred from the nucleus to the cytoplasm. Without the *rev* protein, structural proteins are not made.

In the cytoplasm, the virus co-opts the cell's protein-making machinery – including structures called ribosomes – to make long chains of viral proteins and enzymes, using HIV mRNA as a template. This process is called translation.

Assembly and budding. Newly made HIV core proteins, enzymes and RNA gather just inside the cell's membrane, while the viral envelope proteins aggregate within the membrane. An immature viral particle forms and pinches off from the cell, acquiring an envelope that includes both cellular and HIV proteins from the cell membrane. During this part of the viral life cycle, the core of the virus is immature and the virus is not yet infectious. The long chains of proteins and enzymes that make up the immature viral core are now cleaved into smaller pieces by a viral enzyme called protease. This step results in infectious viral particles.

Drugs called protease inhibitors interfere with this step of the viral life cycle. Four such drugs – saquinavir, ritonavir, indinavir and nelfinavir – have been approved for marketing in the United States.

Transmission of HIV

Among adults, HIV is spread most commonly during sexual intercourse with an infected partner. During sex, the virus can enter the body through the mucosal linings of the vagina, vulva, penis, rectum or, rarely, via the mouth. The likelihood of transmission is increased by factors that may damage these linings, especially other sexually transmitted diseases that cause ulcers or inflammation.

Research suggests that immune system cells called dendritic cells, which reside in the mucosa, may begin the infection process after sexual exposure by binding to and carrying the virus from the site of infection to the lymph nodes where other immune system cells become infected.

HIV also can be transmitted by contact with infected blood, most often by the sharing of drug needles or syringes contaminated with minute quantities of blood containing the virus. The risk of acquiring HIV from blood transfusions is now extremely small in the United States, as all blood products in this country are screened routinely for evidence of the virus.

Almost all HIV-infected children acquire the virus from their mothers before or during birth. In the United States, approximately 25 percent of pregnant HIV-infected women not receiving antiretroviral therapy have passed on the virus to their babies. NIAID-sponsored researchers have shown that a specific regimen of the drug zidovudine (AZT) can reduce the risk of transmission of HIV from mother to baby by two-thirds. Research using combinations of approved anti-HIV drugs is underway to determine if the transmission rate can be further reduced.

The virus also may be transmitted from a nursing HIV-infected mother to her infant.

Early Events in HIV Infection

Once it enters the body, HIV infects a large number of CD4+ cells and replicates rapidly. During this acute or primary phase of infection, the blood contains many viral particles that spread throughout the body, seeding various organs, particularly the lymphoid organs. Lymphoid organs include the lymph nodes, spleen, tonsils and adenoids.

During the acute phase of infection, the number of CD4+ T cells in the bloodstream decreases by 20 to 40 percent. Scientists do not yet know whether these cells are killed by HIV or if they leave the blood and go to the lymphoid organs in preparation to mount an immune response.

Two to four weeks after exposure to the virus, up to 70 percent of HIV-infected persons suffer flu-like symptoms related to the acute infection. The patient's immune system fights back with killer T cells (CD8+ T cells) and B-cell-produced antibodies, which dramatically reduce HIV levels. A patient's CD4+ T cell count may rebound to 80 to 90 percent of its original level. A person then may remain free of HIV-related symptoms for years despite continuous replication of HIV in the lymphoid organs seeded during the acute phase of infection.

One reason HIV is unique is that despite the body's aggressive immune responses, which are sufficient to clear most viral infections, some HIV invariably escapes. This is due in large part to the high rate of mutations that occur during the process of HIV replication. Even when the virus does not avoid the immune system by mutating , the body's best soldiers in the fight against HIV – certain subsets of killer T cells – may multiply so rapidly following initial infection that they become exhausted and disappear, allowing HIV to escape and continue replication.

In addition, early in the course of HIV infection, patients may lose HIV-specific CD4+ T cell responses that normally slow the replication of viruses. Such responses include the secretion of interferons and other antiviral factors, and the orchestration of CD8+ T cells.

Course of HIV Infection

Among patients enrolled in large epidemiologic studies in western countries, the median time from infection with HIV to the development of AIDS-related symptoms has been approximately 10 to 12 years. However, researchers have observed a wide variation in disease progression. Approximately 10 percent of HIV-infected people in these studies have progressed to AIDS within the first two to three years following infection, while up to 5 percent of individuals in the studies have stable CD4+ T cell counts and no symptoms even after 12 or more years.

Factors such as age or genetic differences among individuals, the level of virulence of an individual strain of virus, and co-infection with other microbes may influence the rate and severity of disease progression. Drugs that fight the infections associated with AIDS have improved and prolonged the lives of HIV-infected people by preventing or treating conditions such as *Pneumocystis carinii* pneumonia.

HIV co-receptors and disease progression. Recent research has shown that most infecting strains of HIV use a co-receptor molecule called CCR5, in addition to the CD4 molecule, to enter certain of its target cells. HIV-infected people with a specific mutation in one of their two copies of the gene for this receptor generally have a slower disease course than people with two normal copies of the gene. Rare individuals with two mutant copies of the CCR5 gene appear – in most cases – to be completely protected from HIV infection. Mutations in the gene for other HIV co-receptors also may influence the rate of disease progression.

Viral burden predicts disease progression. Numerous studies show that people with high levels of HIV in their bloodstream are more likely to develop new AIDS-related symptoms or die than individuals with lower levels of virus. For instance, in the Multicenter AIDS Cohort Study (MACS), NIAID-supported investigators demonstrated that the level of HIV in an individual's plasma soon after infection – the so-called viral "set point" – is highly predictive of the rate of disease progression; that is, patients with high levels of virus are much more likely to get sicker, faster, than those with low levels of virus. The MACS and other studies have provided the rationale for providing aggressive antiretroviral therapy to HIV-infected people, as well as for routinely using newly available blood tests to measure viral load when initiating, monitoring and modifying anti-HIV therapy.

New anti-HIV drug combinations – which generally include a protease inhibitor taken with two reverse transcriptase inhibitors – can reduce a person's "viral burden" to very low levels and in many cases delay the progression of HIV disease for prolonged periods. However, antiretroviral regimens have yet to completely and permanently suppress the virus in HIV-infected people. Recent studies have shown that HIV persists in a replication-competent form in resting CD4+ T cells even in patients receiving aggressive antiretroviral therapy who have no easily detectable HIV in their blood. Investigators around the world are working to develop the next generation of anti-HIV drugs.

HIV is Active in the Lymph Nodes

Although HIV-infected individuals often exhibit an extended period of clinical latency with little evidence of disease, the virus is never truly latent. NIAID researchers have shown that even early in disease, HIV actively replicates within the lymph nodes and related organs, where large amounts of virus become trapped in networks of specialized cells with long, tentacle-like extensions. These cells are called follicular dendritic cells (FDCs).

FDCs are located in hot spots of immune activity called germinal centers. They act like flypaper, trapping invading pathogens (including HIV) and holding them until B cells come along to initiate an immune response.

Close on the heels of B cells are CD4+ T cells, which rush into the germinal centers to help B cells fight the invaders. CD4+ T cells, the primary targets of HIV, may become infected as they encounter HIV trapped on FDCs. Research suggests that HIV trapped on FDCs remains infectious, even when coated with antibodies. Thus, FDCs are an important reservoir of HIV, and the large quantity of infectious HIV trapped on FDCs may explain in part how the momentum of HIV infection is maintained

Once infected, CD4+ T cells may leave the germinal center and infect other CD4+ cells that congregate in the region of the lymph node surrounding the germinal center.

Over a period of years, even when little virus is readily detectable in the blood, significant amounts of virus accumulate in the germinal centers, both within infected cells and bound to FDCs. In and around the germinal centers, numerous CD4+ T cells are probably activated by the increased production of cytokines such as TNF-alpha and IL-6, possibly secreted by B cells. Activation allows uninfected cells to be more easily infected and increases replication of HIV in already infected cells.

While greater quantities of certain cytokines such as TNF-alpha and IL-6 are secreted during HIV infection, others with key roles in the regulation of normal immune function may be secreted in **decreased** amounts. For example, CD4+ T cells may lose their capacity to produce interleukin 2 (IL-2), a cytokine that enhances the growth of other T cells and helps to stimulate other cells' response to invaders. Infected cells also have low levels of receptors for IL-2, which may reduce their ability to respond to signals from other cells.

Breakdown of FDC networks. Ultimately, accumulated HIV overwhelms the FDC networks. As these networks break down, their trapping capacity is impaired, and large quantities of virus enter the bloodstream.

Although it remains unclear why FDCs die and the FDC networks dissolve, some scientists think that this process may be as important in HIV pathogenesis as the loss of CD4+ T cells. The destruction of the lymph node structure seen late in HIV disease may preclude a successful immune response against not only HIV but other pathogens as well. This devastation heralds the onset of the opportunistic infections and cancers that characterize AIDS.

Role of CD8+ T Cells

CD8+ T cells are important in the immune response to HIV during the acute infection and the clinically latent stage of disease. These cells attack and kill infected cells that are producing virus.

CD8+ T cells also appear to secrete soluble factors that suppress HIV replication. Several molecules, including RANTES, MIP-1alpha, MIP-1beta, and MDC appear to block HIV replication by occupying the co-receptors necessary for the entry of many strains of HIV into their target cells. There may be many other immune system molecules – yet undiscovered – that can suppress HIV replication to some degree.

Rapid Replication and Mutation of HIV

HIV replicates rapidly; several billion new virus particles may be produced every day. In addition, the HIV reverse transcriptase enzyme makes many mistakes while making DNA copies from HIV RNA. As a consequence, many variants of HIV develop in an individual, some of which may escape destruction by antibodies or killer T cells. Additionally, HIV can recombine with itself to produce a wide range of variants or strains.

During the course of HIV disease, viral strains emerge in an infected individual that differ widely in their ability to infect and kill different cell types, as well as in their rate of replication. Scientists are investigating why strains of HIV from patients with advanced disease appear to be more virulent and infect more cell types than strains obtained earlier from the same individual.

Theories of Immune System Cell Loss in HIV Infection

Researchers around the world are studying how HIV destroys or disables CD4+ T cells, and many think that a number of mechanisms may occur simultaneously in an HIV-infected individual. Recent data suggest that billions of CD4+ T cells may be destroyed every day, eventually overwhelming the immune system's regenerative capacity.

Direct cell killing. Infected CD4+ T cells may be killed directly when large amounts of virus are produced and bud off from the cell surface, disrupting the cell membrane, or when viral proteins and nucleic acids collect inside the cell, interfering with cellular machinery.

Syncytia formation. Infected cells also may fuse with nearby uninfected cells, forming balloon-like giant cells called syncytia. In test-tube experiments at NIAID and elsewhere, these giant cells have been associated with the death of uninfected cells. The presence of so-called syncytia-inducing variants of HIV has been correlated with rapid disease progression in HIV-infected individuals.

Apoptosis. Infected CD4+ T cells may be killed when cellular regulation is distorted by HIV proteins, probably leading to their suicide by a process known as programmed cell death or apoptosis. Recent reports indicate that apoptosis occurs to a greater extent in HIV-infected individuals, both in the bloodstream and lymph nodes.

Uninfected cells also may undergo apoptosis. Investigators have shown in cell cultures that the HIV envelope alone or bound to antibodies sends an inappropriate signal to CD4+ T cells causing them to undergo apoptosis even if not infected by HIV.

Innocent bystanders. Uninfected cells may die in an innocent bystander scenario: HIV particles may bind to the cell surface, giving them the appearance of an infected cell and marking them for destruction by killer T cells.

Killer T cells also may mistakenly destroy uninfected cells that have consumed HIV particles and that display HIV fragments on their surfaces. Alternatively, because HIV envelope proteins bear some resemblance to certain molecules that may appear on CD4+ T cells, the body's immune responses may mistakenly damage such cells as well.

Anergy. Researchers have shown in cell cultures that CD4+ T cells can be turned off by a signal from HIV that leaves them unable to respond to further immune stimulation. This inactivated state is known as anergy.

Superantigens. Other investigators have proposed that a molecule known as a superantigen, either made by HIV or an unrelated agent, may stimulate massive quantities of CD4+ T cells at once, rendering them highly susceptible to HIV infection and subsequent cell death.

Damage to Precursor Cells. Studies suggest that HIV also destroys precursor cells that mature to have special immune functions, as well as the parts of the bone marrow and the thymus needed for the development of such cells. These organs probably lose the ability to regenerate, further compounding the suppression of the immune system.

Central Nervous System Damage

Although monocytes and macrophages can be infected by HIV, they appear to be relatively resistant to killing. However, these cells travel throughout the body and carry HIV to various organs, especially the lungs and brain. People infected with HIV often experience abnormalities in the central nervous system. Neurologic manifestations of HIV disease, seen in 40 to 50 percent of HIV-infected people, are the subject of many research projects. Investigators have hypothesized that an accumulation of HIV in brain and nerve cells, or the inappropriate release of cytokines or toxic byproducts by these cells, may be to blame.

Role of Immune Activation in HIV Disease

During a normal immune response, many components of the immune system are mobilized to fight an invader. CD4+ T cells, for instance, may quickly proliferate and increase their cytokine secretion, thereby signalling other cells to perform their special functions. Scavenger cells called macrophages may double in size and develop numerous organelles, including lysosomes that contain digestive enzymes used to process ingested pathogens. Once the immune system clears the foreign antigen, it returns to a relative state of quiescence.

Paradoxically, although it ultimately causes immune deficiency, HIV disease for most of its course is characterized by immune system hyperactivation, which has negative consequences. As noted above, HIV replication and spread are much more efficient in activated CD4+ cells. Chronic immune system activation during HIV disease may also result in a massive stimulation of a person's B cells, impairing the ability of these cells to make antibodies against other pathogens.

Chronic immune activation also can result in apoptosis, and an increased production of cytokines that may not only increase HIV replication but also have other deleterious effects. Increased levels of TNF-alpha, for example, may be at least partly responsible for the severe weight loss or wasting syndrome seen in many HIV-infected individuals.

The persistence of HIV and HIV replication probably plays an important role in the chronic state of immune activation seen in HIV-infected people. In addition, researchers have shown that infections with other organisms activate immune system cells and increase production of the virus in HIV-infected people. Chronic immune activation due to persistent infections, or the cumulative effects of multiple episodes of immune activation and bursts of virus production, likely contribute to the progression of HIV disease.

NIAID Research on the Pathogenesis of AIDS

NIAID-supported scientists conduct HIV pathogenesis research in laboratories on the campus of the National Institutes of Health (NIH) in Bethesda, Md., at the Institute's Rocky Mountain Laboratories in Hamilton, Mont., and at universities and medical centers in the United States and abroad.

An NIAID-supported collaborative center of the World Health Organization, known as the NIH AIDS Research and Reference Reagent Program, provides AIDS-related research materials free to qualified researchers around the world.

In addition, the Institute convenes groups of investigators and advisory committees to exchange scientific information, clarify research priorities and bring research needs and opportunities to the attention of the scientific community.

The NIAID HIV/AIDS Research Agenda and fact sheets on NIAID HIV/AIDS vaccine research, clinical trials for AIDS therapies and vaccines, and AIDS-related opportunistic infections are available from the NIAID Office of Communications. To receive free copies, call (301) 496-5717, Monday through Friday, 8:30 a.m. to 5:00 p.m. Eastern Time. These materials also are available via the NIAID home page on the Internet at http://www.niaid.nih.gov.

NIAID, a component of the National Institutes of Health, supports research on AIDS, tuberculosis, malaria and other infectious diseases, as well as allergies and immunology. NIH is an agency of the U.S. Department of Health and Human Services.

Press releases, fact sheets and other NIAID-related materials are available on the Internet via the NIAID home page at http://www.niaid.nih.gov.

Glossary

apoptosis: cellular suicide, also known as programmed cell death. HIV may induce apoptosis in both infected and uninfected immune system cells.

B cells: white blood cells of the immune system that produce infection-fighting proteins called antibodies.

CD4+ T cells: white blood cells that orchestrate the immune response, signalling other cells in the immune system to perform their special functions. Also known as T helper cells, these cells are killed or disabled during HIV infection.

CD8+ T cells: white blood cells that kill cells infected with HIV or other viruses, or transformed by cancer. These cells also secrete soluble molecules that may suppress HIV without killing infected cells directly.

cytokines: proteins used for communication by cells of the immune system. Central to the normal regulation of the immune response.

cytoplasm: the living matter within a cell.

dendritic cells: immune system cells with long, tentacle-like branches. Some of these are specialized cells at the mucosa that may bind to HIV following sexual exposure and carry the virus from the site of infection to the lymph nodes. See also follicular dendritic cells.

enzyme: a protein that accelerates a specific chemical reaction without altering itself.

follicular dendritic cells (FDCs): cells found in the germinal centers (B cell areas) of lymphoid organs. FDCs have thread-like tentacles that form a web-like network to trap invaders and present them to B cells, which then make antibodies to attack the invaders.

germinal centers: structures within lymphoid tissues that contain FDCs and B cells, and in which immune responses are initiated.

gp41: glycoprotein 41, a protein embedded in the outer envelope of HIV. Plays a key role in HIV's infection of CD4+ T cells by facilitating the fusion of the viral and cell membranes.

gp120: glycoprotein 120, a protein that protrudes from the surface of HIV and binds to CD4+ T cells.

gp160: glycoprotein 160, an HIV precursor protein that is cleaved by the HIV protease enzyme into gp41 and gp120.

integrase: an HIV enzyme used by the virus to integrate its genetic material into the host cell's DNA.

Kaposi's sarcoma: a type of cancer characterized by abnormal growths of blood vessels that develop into purplish or brown lesions.

killer T cells: see CD8+ T cells.

lentivirus: "slow" virus characterized by a long interval between infection and the onset of symptoms. HIV is a lentivirus as is the simian immunodeficiency virus (SIV), which infects nonhuman primates.

LTR: long terminal repeat, the RNA sequences repeated at both ends of HIV's genetic material. These regulatory switches may help control viral transcription.

lymphoid organs: include tonsils, adenoids, lymph nodes, spleen and other tissues. Act as the body's filtering system, trapping invaders and presenting them to squadrons of immune cells that congregate there.

macrophage: a large immune system cell that devours invading pathogens and other intruders. Stimulates other immune system cells by presenting them with small pieces of the invaders.

monocyte: a circulating white blood cell that develops into a macrophage when it enters tissues.

opportunistic infection: an illness caused by an organism that usually does not cause disease in a person with a normal immune system. People with advanced HIV infection suffer opportunistic infections of the lungs, brain, eyes and other organs.

pathogenesis: the production or development of a disease. May be influenced by many factors, including the infecting microbe and the host's immune response.

protease: an HIV enzyme used to cut large HIV proteins into smaller ones needed for the assembly of an infectious virus particle.

provirus: DNA of a virus, such as HIV, that has been integrated into the genes of a host cell.

retrovirus: HIV and other viruses that carry their genetic material in the form of RNA and that have the enzyme reverse transcriptase.

reverse transcriptase: the enzyme produced by HIV and other retroviruses that allows them to synthesize DNA from their RNA.

syncytia: giant cells formed by the fusion of other cells.

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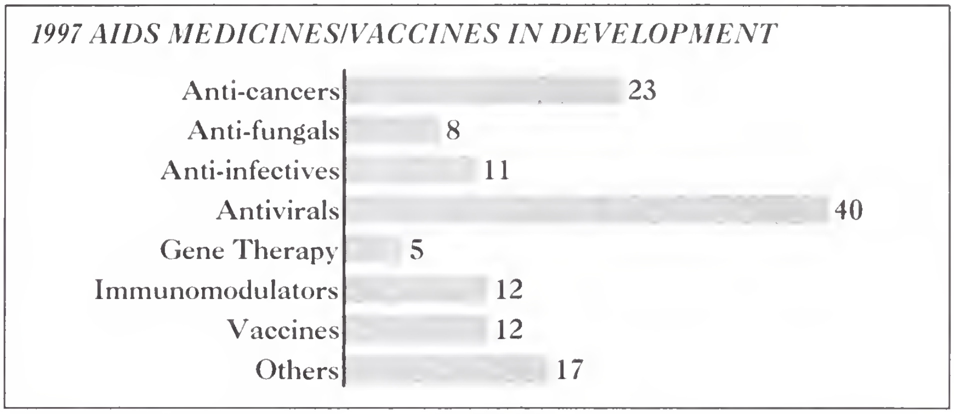
NEW MEDICINES
IN DEVELOPMENT
FOR AIDS

Presented by America's Pharmaceutical Research Companies

1997 Survey

Drug Companies Step Up Efforts Against AIDS; 124 New Medicines and Vaccines Are in Development


1997 AIDS MEDICINES/VACCINES IN DEVELOPMENT

In 1997, pharmaceutical innovation has helped deliver some good news about AIDS:

- Two protease inhibitors were approved to treat children with AIDS.
- A new medicine that combines two widely prescribed AIDS drugs in a single tablet was approved by the Food and Drug Administration (FDA), a first important step toward simplifying the highly effective—but complex—combination drug therapy.
- Deaths from AIDS fell 26 percent in 1996 and new cases of AIDS dropped for the first time in 16 years, the Centers for Disease Control reported. Some 10,000 fewer people died of AIDS in 1996 than in 1995, and AIDS is no longer the leading killer of young Americans.
- Combination drug therapy, including a protease inhibitor, enables AIDS patients to live longer and suffer fewer infections, even if they are in advanced stages of the disease, according to a report by the National Institutes of Health (NIH).
- Scientific papers published in *Nature* raised the possibility that three years of treatment with powerful new drugs could completely eliminate the AIDS virus from patients' bodies.
- Treating HIV-positive pregnant women with the antiviral drug AZT is highly effective in preventing transmission of the virus to babies, even in women with advanced AIDS, the NIH reported.

Pharmaceutical companies are building on this encouraging progress and intensifying the search for a cure and a preventive vaccine for AIDS. A new survey by the Pharmaceutical Research and Manu-facturers of America (P*h*RMA) found 124 potential medicines and vaccines either in clinical trials or under review by the FDA. These medicines in development will add to the arsenal of 50 medicines already approved to treat AIDS and AIDS-related conditions.

Medicines in development identified by the survey include:

- 40 antiviral medicines, including new protease inhibitors;
- 23 medicines to fight AIDS-related cancers such as Kaposi's sarcoma;
- 12 immunomodulators designed to stimulate the patient's own immune system to fight the AIDS virus;
- 11 anti-infective medicines to fight against such deadly diseases as *Pneumocystis carinii* pneumonia, a lung infection that affects 8 out of 10 AIDS patients;
- 8 anti-fungal medications aimed at thwarting fungal infections that can prove deadly to people with compromised immune systems;
- 5 gene therapies designed to genetically alter cells in patients' bodies to make them more resistant to the AIDS virus or to alter the virus itself; and
- 12 vaccines.

Pharmaceutical and biotechnology companies were researching vaccines long before President Clinton called for the development of an AIDS vaccine by the year 2007. Despite formidable scientific, ethical and legal obstacles, the P*h*RMA survey shows that progress is being made toward this goal. For example, the first DNA-based preventive AIDS vaccines are now in human clinical trials. The aim of these vaccines is to provoke an immune response that will protect against HIV infection.

Considering that the AIDS virus was identified only 14 years ago, the progress already made against AIDS has been a remarkable achievement. A pharmaceutical company won FDA approval of the first drug to treat AIDS in 1987. Only a decade later, there are 50 approved medicines to treat AIDS and related conditions, and another 124 in development. But, despite the drop in AIDS deaths and in new cases of AIDS reported during the past year, this disease is still a major killer. AIDS is the eighth leading cause of death for Americans of all ages, the seventh leading cause of death among children 14 and under, and the leading cause of death for African Americans between the ages of 25 and 44.

Pharmaceutical companies are building on the knowledge gained and the techniques developed during the past decade and stepping up efforts to knock this killer disease off the charts.

Alan F. Holmer

Alan F. Holmer
President
P*h*RMA

AIDS Medicines in Development

Anti-cancers

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS	
9-aminocamptothecin	National Cancer Institute (Bethesda, MD) IDEC Pharmaceuticals (San Diego, CA)	AIDS-related Kaposi's sarcoma	Phase II *(NCI Trial)*	(WMA)
9-cis-retinoic acid	National Cancer Institute (Bethesda, MD) Ligand Pharmaceuticals (San Diego, CA)	AIDS-related Kaposi's sarcoma	Phase I/II *(NCI Trial)*	(WMA)
A-007	Dekk-Tec (New Orleans, LA)	AIDS-related Kaposi's sarcoma	Phase I	(WA)
Alferon N Injection®† interferon alfa-n3	Interferon Sciences (New Brunswick, NJ)	Kaposi's sarcoma (see also antivirals)	Phase II	(WA)
Atragen™ tretinoin	Aronex Pharmaceuticals (The Woodlands, TX)	AIDS-related Kaposi's sarcoma	Phase II completed	(WMA)
bryostatin-1	National Cancer Institute (Bethesda, MD) Bristol-Myers Squibb (Princeton, NJ)	AIDS-related Kaposi's sarcoma	Phase II *(NCI Trial)*	(WMA)
DaunoXome®† daunorubicin citrate liposome injection	NeXstar Pharmaceuticals (Boulder, CO)	non-Hodgkin's lymphoma and certain leukemias	Phase II	(WCMAB)
gallium nitrate†	National Cancer Institute (Bethesda, MD) Solopak Laboratories (Elk Grove Village, IL)	AIDS-related non-Hodgkin's lymphoma	Phase II *(NCI Trial)*	(WMA)
interleukin-12	National Cancer Institute (Bethesda, MD) Genetics Institute (Cambridge, MA)	AIDS-related Kaposi's sarcoma	Phase I/II *(NCI Trial)*	(WMA)
Lidakol® n-docosanol	LIDAK Pharmaceuticals (La Jolla, CA)	AIDS-related Kaposi's sarcoma	Phase II	
Panretin™ Oral LGD 1057	Ligand Pharmaceuticals (San Diego, CA)	AIDS-related Kaposi's sarcoma	Phase II/III	(WCMAB)
Panretin™ Topical Gel LGD 1057	Ligand Pharmaceuticals (San Diego, CA)	AIDS-related Kaposi's sarcoma	Phase III completed	(WMA)
Paxene™ paclitaxel	IVAX/Baker Norton Pharmaceuticals (Miami, FL)	AIDS-related Kaposi's sarcoma	application submitted	(M)
peldesine (BCX-34)	BioCryst Pharmaceuticals (Birmingham, AL)	cutaneous T-cell lymphoma (see also immunomodulators)	Phase I	(WM)

WCMAB codes in parentheses to right of development status:
W—Women are included in the human clinical trials for this product.
C —Children are included in the human clinical trials for this product.
M—Racial and ethnic minorities are included in the human clinical trials for this product.
A —This product is being developed with the intent of labeling and marketing for use in women.
B —This product is being developed with the intent of labeling and marketing for use in children.

†—Denotes medicines that have been approved by the FDA for other uses.

Anti-cancers

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
PhotoPoint™ photodynamic therapy	Miravant Medical Technologies (Santa Barbara, CA)	AIDS-related Kaposi's sarcoma	Phase III (WMA)
piritrexim	ILEX Oncology (San Antonio, TX) MPI (Mattawan, MI)	cutaneous AIDS-related Kaposi's sarcoma	Phase III (WMA)
Proleukin®† aldesleukin interleukin-2 (IL-2)	National Cancer Institute (Bethesda, MD) Chiron (Emeryville, CA)	AIDS-related Kaposi's sarcoma (see also immunomodulators)	Phase II (WMA) *(NCI Trial)*
Targretin™ Oral LGD 1069	Ligand Pharmaceuticals (San Diego, CA)	AIDS-related Kaposi's sarcoma	Phase II/III (WMA)
thalidomide	Andrulis Pharmaceuticals (Beltsville, MD)	AIDS-related Kaposi's sarcoma (see also immunomodulators)	Phase II (WMAB)
thalidomide	National Cancer Institute (Bethesda, MD) EntreMed (Rockville, MD)	AIDS-related Kaposi's sarcoma	Phase II (WMA) *(NCI Trial)*
topotecan	SmithKline Beecham (Philadelphia, PA)	Kaposi's sarcoma, lymphoma, progressive multifocal leukoencephalopathy (PML)	Phase II
Virulizin®	Imutec Pharma (Scarborough, Ontario)	AIDS-related malignancies, including lymphoma and Kaposi's sarcoma	Phase I/II (WMA)
Zyrkamine mitoquazone	ILEX Oncology (San Antonio, TX)	AIDS-related non-Hodgkin's lymphoma	Phase II completed (WCMA)

Anti-fungals

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
AmBisome®† liposomal amphotericin B	NeXstar Pharmaceuticals (Boulder, CO)	cryptococcal meningitis, histoplasmosis	Phase III (WMAB)
Lamisil® Tablets† terbinafine HCl	Novartis Pharmaceuticals (East Hanover, NJ)	mucosal candidiasis in HIV-positive patients	Phase II (WM)
LY303366 IV	Eli Lilly (Indianapolis, IN)	treatment of systemic fungal infections due to *Candida* and *Aspergillus*, febrile neutropenia, PCP	Phase II (WCMAB)
LY303366 oral	Eli Lilly (Indianapolis, IN)	treatment of muco-cutaneous candidiasis (including oral thrush and vaginal candidiasis), prevention of systemic fungal infections, treatment and prevention of *Pneumocystis carinii* pneumonia (PCP)	Phase II (WCMAB)
Nyotran™ liposomal nystatin	Aronex Pharmaceuticals (The Woodlands, TX)	systemic fungal infections	Phase III (WCMAB)
Oramed™ C319-14/16	Biosyn (Philadelphia, PA)	HIV-related oral candidiasis	Phase II (WMA)
Sporanox® IV itraconazole	Janssen Pharmaceutica (Titusville, NJ)	systemic mycoses	Phase III
UK-109,496 voriconazole	Pfizer (New York, NY)	candidiasis, aspergillosis	Phase III

Anti-infectives

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
BWPT	Biomune Systems (Salt Lake City, UT)	cryptosporidiosis	Phase II (WCMAB)
dapsone†	Jacobus Pharmaceutical (Princeton, NJ)	PCP prophylaxis	Phase III
dapsone† with trimethoprim	Jacobus Pharmaceutical (Princeton, NJ)	PCP treatment	Phase III
KRM-1648	PathoGenesis (Seattle, WA)	mycobacterium avium complex (MAC)	Phase I (MA)
LY333328	Eli Lilly (Indianapolis, IN)	bacteremia including those due to vancomycin-resistant gram positive pathogens, skin and skin structure infections, endocarditis, osteomyelitis, septic arthritis, meningitis due to streptococcus pneumonia including penicillin-resistant strains	Phase I (WCMAB)
Mepron™† atovaquone	Glaxo Wellcome (Rsch. Triangle Park, NC)	PCP prophylaxis	Phase III
nitazoxanide (NTZ)	Unimed Pharmaceuticals (Buffalo Grove, IL)	cryptosporidiosis	Phase III (WMAB)
rifapentine	Hoechst Marion Roussel (Kansas City, MO)	tuberculosis	Phase II
Sporidin-G™ bovine immunoglobulin concentrate, *C. parvum*	Galagen (Arden Hills, MN)	cryptosporidiosis	Phase II (WCMAB)
Trovan™ trovafloxacin	Pfizer (New York, NY)	nosocomial infections	application submitted
Zithromax† azithromycin	Pfizer (New York, NY)	mycobacterium avium intracellular (MAI) treatment	Phase III

Antivirals

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
1263	Glaxo Wellcome (Rsch. Triangle Park, NC)	CMV retinitis in AIDS patients	Phase I/II
141W94 protease inhibitor (VX-478)	Glaxo Wellcome (Rsch. Triangle Park, NC) Vertex Pharmaceuticals (Cambridge, MA)	HIV infection, AIDS	Phase III
1592U89	Glaxo Wellcome (Rsch. Triangle Park, NC)	HIV infection	Phase III
ABT-378	Abbott Laboratories (Abbott Park, IL)	HIV infection	Phase I (WMAB)
AD-439	Tanox Biosystems (Houston, TX)	HIV infection, AIDS	Phase II (WMAB)
AD-439 and AD-519 combination	Tanox Biosystems (Houston, TX)	HIV infection, AIDS	Phase II (WMAB)
AD-519	Tanox Biosystems (Houston, TX)	HIV infection, AIDS	Phase II (WMAB)
Alferon LDO®† interferon alfa-n3	Interferon Sciences (New Brunswick, NJ)	AIDS	Phase I/II (WMA)

Antivirals

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
Alferon N Injection®† interferon alfa-n3	Interferon Sciences (New Brunswick, NJ)	HIV infection (see also anti-cancers)	Phase III (WMA)
Aztec® zidovudine (controlled release)	Verex Laboratories (Englewood, CO)	early HIV infection, AIDS	Phase III (WMA)
beta-fluoro-ddA (f-ddA)	National Cancer Institute (Bethesda, MD) U.S. Bioscience (W. Conshohocken, PA)	AIDS-associated diseases	Phase I *(NCI Trial)* (WCMAB)
calanolide A (non-nucleoside reverse transcriptase inhibitor)	Sarawak MediChem Pharmaceuticals (Lemont, IL)	HIV infection	Phase I
CI-1012	Warner-Lambert (Morris Plains, NJ)	HIV infection	Phase I/II (WMAB)
DEHOP	SunPharm (Jacksonville, FL)	AIDS-related chronic diarrhea	Phase II (WMA)
DMP-450 (second generation protease inhibitor)	Triangle Pharmaceuticals (Durham, NC)	HIV infection, AIDS	Phase I/II (WCMAB)
Famvir® famciclovir	SmithKline Beecham (Philadelphia, PA)	herpes zoster, recurrent herpes simplex	application submitted
Fomivirsen ISIS 2922	Isis Pharmaceuticals (Carlsbad, CA)	CMV retinitis in AIDS patients	Phase III
FTC (nucleoside analogue)	Triangle Pharmaceuticals (Durham, NC)	HIV infection, AIDS	Phase I/II (WCMAB)
GEM-132	Hybridon (Cambridge, MA)	CMV retinitis in AIDS (intravenous administration)	Phase II
		CMV retinitis in AIDS (intravitreal administration)	Phase I/II
HBY097 (non-nucleoside reverse transcriptase inhibitor)	Hoechst Marion Roussel (Kansas City, MO)	HIV infection (type 1)	Phase II
Invirase® saquinavir mesylate in combination with **Norvir**™ ritonavir and either **Retrovir**® zidovudine (AZT) or **Epivir**® lamivudine (3TC)	Hoffmann-La Roche (Nutley, NJ)	HIV infection in adults	Phase III (WMA)
lobucavir	Bristol-Myers Squibb (Princeton, NJ)	CMV infection in AIDS patients, genital herpes	Phase II
MKC-442 (non-nucleoside reverse transcriptase inhibitor)	Triangle Pharmaceuticals (Durham, NC)	HIV infection, AIDS	Phase II (WCMAB)

Antivirals

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
Panavir probucol	Vyrex (La Jolla, CA)	HIV infection, AIDS	Phase II (WMA)
PMPA (oral)	Gilead Sciences (Foster City, CA)	HIV infection	Phase I/II (WMAB)
PNU-140690 protease inhibitor	Pharmacia & Upjohn (Kalamazoo, MI)	HIV infection, AIDS	Phase II
Preveon™ adefovir dipivoxil	Gilead Sciences (Foster City, CA)	HIV infection	Phase II/III (WCMAB)
PRO 367	Progenics (Tarrytown, NY)	HIV infection	Phase I
PRO 542	Progenics (Tarrytown, NY)	HIV infection	Phase I/II
RBC-CD4	Sheffield Medical Technologies (Houston, TX)	HIV infection	Phase I/II (WMA)
S-1153 (non-nucleoside reverse transcriptase inhibitor)	Shionogi (Hackensack, NJ)	HIV infection	Phase I
Sustiva™ efavirenz (DMP 266)	Du Pont Merck (Wilmington, DE)	HIV infection	Phase III (WMA)
valganciclovir	Hoffmann-La Roche (Nutley, NJ)	treatment of CMV retinitis	Phase III
Valtrex™† valacyclovir	Glaxo Wellcome (Rsch. Triangle Park, NC)	suppression of CMV infection and disease	Phase III (WMA)
VIDEX®† didanosine (ddI) (once daily formulation)	Bristol-Myers Squibb (Princeton, NJ)	HIV infection	Phase II
VIDEX®† didanosine (ddI) with **Zerit™** stavudine (d4T)	Bristol-Myers Squibb (Princeton, NJ)	HIV infection	application submitted
VIMRxyn™ hypericin	VIMRx Pharmaceuticals (Wilmington, DE)	cutaneous T-cell lymphoma (topical photo therapy)	Phase I/II
		HIV infection, AIDS	Phase I (WMAB)
Virend® (SP-303)	Shaman Pharmaceuticals (S. San Francisco, CA)	genital herpes	Phase II
VX-478 in combination with **Retrovir®** zidovudine (AZT) and **Epivir®** lamivudine (3TC)	Vertex Pharmaceuticals (Cambridge, MA)	HIV infection, AIDS	Phase III (WCAB)
Zintevir™ AR177	Aronex Pharmaceuticals (The Woodlands, TX)	HIV infection	Phase I/II (WMA)

Gene Therapy

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
CTL (adoptive immunotherapy)	Targeted Genetics (Seattle, WA)	HIV infection	Phase I (WMA)
HIV-IT(V)	Chiron Technologies (San Diego, CA)	HIV infection	Phase II (WMA)
HMR 4004 (gene-modified T-lymphocytes)	Hoechst Marion Roussel (Kansas City, MO)	HIV infection, AIDS	Phase I
RevMio-transduced hematopoietic stem cell gene therapy (RevMio-HSC)	Novartis Pharmaceuticals (East Hanover, NJ) SyStemix (Palo Alto, CA)	HIV-1 infection	Phase I/II (WMAB)
T-cell gene therapy	Cell Genesys (Foster City, CA)	HIV infection	Phase I/II (W)

Immunomodulators

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
Ampligen	HemispheRx Biopharma (Philadelphia, PA)	HIV infection	Phase II (WMA)
Anticort procaine HCl	Steroidogenesis Inhibitors (Las Vegas, NV)	HIV infection	Phase II (WMA)
HIV-IG™ immunotherapeutic	NABI (Boca Raton, FL)	treatment of HIV infection in children	Phase II (CMB)
Imreg®-1, Imreg-2	Imreg (New Orleans, LA)	HIV infection (asymptomatic and symptomatic)	Phase III (WMA)
interleukin-10 (IL-10)	Schering-Plough (Madison, NJ)	HIV disease	Phase I
Leukine®† sargramostim	Immunex (Seattle, WA)	prevention of HIV-associated opportunistic infections	Phase III (WCMAB)
Multikine™ leukocyte interleukin injection	CEL-SCI (Alexandria, VA)	restore immune response in HIV-infected patients	Phase I (WMA)
peldesine (BCX-34)	BioCryst Pharmaceuticals (Birmingham, AL)	HIV infection, psoriasis (see also anti-cancers)	Phase I (WM)
Perthon abavca	Advanced Plant Pharmaceuticals (New York, NY)	HIV infection	Phase I/II (WMAB)
Proleukin®† aldesleukin, interleukin-2 (IL-2)	Chiron (Emeryville, CA)	HIV infection (see also anti-cancers)	Phase II/III
thalidomide	Andrulis Pharmaceuticals (Beltsville, MD)	oral and esophageal aphthous ulcers, HIV viral load	Phase II/III *(NIAID trial)* (WMAB)
		prurigo nodularis, AIDS, HIV infection (immune system restoration) (see also anti-cancers)	Phase II (WMAB)
Tucaresol immunopotentiator	Glaxo Wellcome (Rsch. Triangle Park, NC)	HIV infection	Phase I/II

Vaccines

VACCINE	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
AIDS vaccine	United Biomedical (Hauppauge, NY)	HIV infection	Phase I/II (WMA)
ALVAC-120TMG (vCP 205)	Pasteur Merieux Connaught (Swiftwater, PA)	HIV infection	Phase II (WCMAB)
Genevax-HIV® Px facilitated DNA-based vaccine	Apollon (Malvern, PA) Wyeth-Lederle Vaccines and Pediatrics, unit of Wyeth-Ayerst Laboratories (Philadelphia, PA)	HIV infection prophylaxis	Phase I
Genevax-HIV® Tx facilitated DNA-based vaccine	Apollon (Malvern, PA) Wyeth-Lederle Vaccines and Pediatrics, unit of Wyeth-Ayerst Laboratories (Philadelphia, PA)	HIV infection treatment	Phase I
gp120	VaxGen (S. San Francisco, CA)	HIV infection treatment and prophylaxis	Phase II completed (WM)
HGP-30	Viral Technologies (CEL-SCI) (Alexandria, VA)	HIV infection treatment	Phase I (WMA)
		HIV infection prophylaxis	Phase I completed (WMA)
HIV peptide AIDS vaccine	National Cancer Institute (Bethesda, MD)	early HIV infection	Phase I *(NCI Trial)* (WMA)
HIV vaccines (gp120)	Chiron (Emeryville, CA)	AIDS	2 in Phase II
Remune® HIV immunotherapeutic vaccine	Immune Response (Carlsbad, CA)	HIV infection treatment (asymptomatic/symptomatic)	Phase III
		pediatric HIV infection	Phase I
TBC-3B recombinant vaccine	Therion Biologics (Cambridge, MA)	AIDS	Phase I (WMA)
Theradigm™-HIV CY2301	Cytel (San Diego, CA)	therapeutic vaccine	Phase I (WMA)

Others

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
ACT (activated cellular therapy)	Neoprobe (Dublin, OH)	AIDS	Phase II (WMA)
Actiq oral transmucosal fentanyl citrate-OTFC	Abbott Laboratories (Abbott Park, IL) Anesta (Salt Lake City, UT)	chronic pain, particularly breakthrough pain	application submitted
Advantage 24	Columbia Laboratories (Miami, FL)	prevention of sexually transmitted diseases, including HIV infection	Phase III
albendazole	SmithKline Beecham (Philadelphia, PA)	microsporidiosis	Phase III
Androderm® testosterone replacement	SmithKline Beecham (Philadelphia, PA)	HIV wasting	Phase III

Others

DRUG	COMPANY	INDICATION	U.S. DEVELOPMENT STATUS
Androgel™-DHT didydrotestosterone gel	Unimed Pharmaceuticals (Buffalo Grove, IL)	HIV wasting syndrome in men	Phase II
HIV therapeutic	United Biomedical (Hauppauge, NY)	block progression from HIV infection to AIDS	Phase I/II (WMA)
IL-2 fusion protein DAB 389 IL-2	Seragen (Hopkinton, MA)	HIV infection	Phase I completed (WMA)
memantine	Neurobiological Technologies (Richmond, CA)	AIDS-related dementia, AIDS-related neuropathic pain	Phase II (WMAB)
NEUPOGEN® filgrastim (G-CSF)	Amgen (Thousand Oaks, CA)	treatment of neutropenia in HIV-infected patients	application submitted
OraLease didofenac and hyaluronic acid	Hyal Pharmaceutical (Mississauga, Ontario)	pain management in AIDS	Phase II (WMA)
Oxandrin™† oxandrolone	Bio-Technology General (Iselin, NJ)	weight loss in AIDS	Phase III (WMA)
Provir™	Shaman Pharmaceuticals (S. San Francisco, CA)	AIDS-related diarrhea	Phase II (WMA)
Savvy™ C319-14/16	Biosyn (Philadelphia, PA)	prevention of HIV transmission	Phase I (WMA)
SNX-111† ziconotide	Neurex (Menlo Park, CA)	management of severe pain (including HIV-infected patients)	Phase III (WMAB)
SPC3	Columbia Laboratories (Rockville, MD)	HIV infection	Phase I
Thalomid thalidomide	Celgene (Warren, NJ)	AIDS wasting	Phase III completed (WMA)
		aphthous stomatitis (ulcers), AIDS-related diarrhea	Phase III (WMA)

Approved Medicines for AIDS and Related Conditions

DRUG	COMPANY	INDICATION
ABELCET® amphotericin B lipid complex	The Liposome Company (Princeton, NJ)	second-line therapy in aspergillosis patients refractory to amphotericin B, invasive fungal infections
Alferon N Injection® interferon alfa-n3	Interferon Sciences (New Brunswick, NJ)	genital warts (condyloma acuminata)
AmBisome® liposomal amphotericin B	Fujisawa Pharmaceutical (Deerfield, IL) NeXstar Pharmaceuticals (Boulder, CO)	primary treatment for fever of unknown origin in neutropenic patients, visceral leishmaniasis, secondary treatment for certain systemic fungal infections
Amphocil™ amphotericin B cholesteryl sulfate lipid for injection	SEQUUS Pharmaceuticals (Menlo Park, CA)	aspergillosis, opportunistic systemic fungal infections
Bactrim™ trimethoprim and sulfamethoxazole	Hoffmann-La Roche (Nutley, NJ)	PCP prophylaxis and treatment
Biaxin™ clarithromycin	Abbott Laboratories (Abbott Park, IL)	mycobacterium avium complex (MAC) prophylaxis and treatment

Approved Medicines for AIDS and Related Conditions

DRUG	COMPANY	INDICATION
Combivir™ lamivudine/ zidovudine tablets	Glaxo Wellcome (Rsch. Triangle Park, NC)	HIV infection
Crixivan® indinavir	Merck (Whitehouse Station, NJ)	HIV infection in adults
Cytovene® ganciclovir (IV)	Roche Bioscience (Palo Alto, CA)	CMV retinitis prophylaxis and treatment
Cytovene® ganciclovir (oral)	Roche Bioscience (Palo Alto, CA)	CMV retinitis maintenance treatment, CMV retinitis prophylaxis in AIDS patients
Daraprim® pyrimethamine	Glaxo Wellcome (Rsch. Triangle Park, NC)	toxoplasmosis treatment
DaunoXome® liposomal daunorubicin citrate	NeXstar Pharmaceuticals (Boulder, CO)	advanced AIDS-related Kaposi's sarcoma
Diflucan® fluconazole	Pfizer (New York, NY)	cryptococcal meningitis, candidiasis, pediatric use for candidiasis, fungal infection prophylaxis and treatment
DOXIL® doxorubicin HCl liposome injection	SEQUUS Pharmaceuticals (Menlo Park, CA)	AIDS-related Kaposi's sarcoma
Epivir™ lamivudine (3TC) with **Retrovir®** zidovudine (AZT)	Glaxo Wellcome (Rsch. Triangle Park, NC)	HIV infection
Fortovase™ saquinavir (soft gel formulation)	Hoffmann-La Roche (Nutley, NJ)	treatment of HIV infection in adults in combination with other antiretroviral agents
Foscavir® Injection foscarnet sodium	Astra USA (Westborough, MA)	CMV retinitis in AIDS patients, acyclovir-resistant herpes simplex virus (HSV) in immunocompromised patients
Gamimune®-N immune globulin intravenous (human)	Bayer, Pharmaceutical Division (Berkeley, CA)	pediatric HIV infection
HIVID® zalcitabine	Hoffmann-La Roche (Nutley, NJ)	in combination with Retrovir® for treatment of adult patients with advanced HIV infection (CD4≤300) who have demonstrated significant clinical or immunologic deterioration, monotherapy for HIV infection in adults with advanced HIV disease
Intron® A interferon alfa-2b (recombinant)	Schering-Plough (Madison, NJ)	Kaposi's sarcoma
Invirase® saquinavir	Hoffmann-La Roche (Nutley, NJ)	treatment of HIV infection in combination with nucleoside analogues
Marinol® dronabinol	Unimed Pharmaceuticals (Buffalo Grove, IL)	treatment of anorexia associated with weight loss in AIDS patients
Megace® megestrol acetate (oral suspension)	Bristol-Myers Squibb (Princeton, NJ)	treatment of anorexia and cachexia associated with AIDS
Mepron® atovaquone	Glaxo Wellcome (Rsch. Triangle Park, NC)	treatment of mild to moderate PCP in individuals intolerant to TMP/SMX
Mycobutin® rifabutin	Pharmacia & Upjohn (Kalamazoo, MI)	MAC prophylaxis in patients with advanced HIV infection

Approved Medicines for AIDS and Related Conditions

DRUG	COMPANY	INDICATION
NebuPent® aerosol pentamidine isethionate	Fujisawa Pharmaceutical (Deerfield, IL)	PCP prophylaxis
Neutrexin™ trimetrexate glucuronate for injection	U.S. Bioscience (W. Conshohocken, PA)	treatment of moderate-to-severe PCP in immunocompromised patients, including patients with AIDS, who are intolerant of or are refractory to TMP/SMX or for whom TMP/SMX is contraindicated
Nizoral® 2% Shampoo ketoconazole	Janssen Pharmaceutica (Titusville, NJ)	tinea versicolor (fungal infection)
Norvir® ritonavir	Abbott Laboratories (Abbott Park, IL)	HIV infection (pediatric and adult)
PASER™ Extended Release Granules para-aminosalicylic acid 4-aminosalicylic acid (PAS)	Jacobus Pharmaceutical (Princeton, NJ)	tuberculosis treatment
Pentacarinate® pentamidine isethionate	Rhone-Poulenc Rorer (Collegeville, PA)	PCP treatment
Pentam® 300 pentamidine isethionate (IM & IV)	Fujisawa Pharmaceutical (Deerfield, IL)	PCP treatment
PROCRIT® epoetin alfa	Ortho Biotech (Raritan, NJ)	anemia in Retrovir®-treated HIV-infected patients
Rescriptor® delvaridine	Pharmacia & Upjohn (Kalamazoo, MI)	HIV infection, AIDS
Retrovir® zidovudine (AZT)	Glaxo Wellcome (Rsch. Triangle Park, NC)	HIV positive (asymptomatic [CD4<500] and symptomatic [ARC, AIDS]), pediatric and adult, prevention of maternal/fetal transmission of HIV infection
Roferon®-A interferon alfa-2a, recombinant/Roche	Hoffmann-La Roche (Nutley, NJ)	Kaposi's sarcoma
Septra® trimethoprim and sulfamethoxazole	Glaxo Wellcome (Rsch. Triangle Park, NC)	PCP prophylaxis and treatment
Serostim™ somatropin (rDNA origin) for injection	Serono Laboratories (Norwell, MA)	treatment of AIDS-associated cachexia (AIDS wasting)
Sporanox® Capsule itraconazole	Janssen Pharmaceutica (Titusville, NJ)	histoplasmosis, blastomycosis, second-line aspergillosis
Sporanox® Oral Solution itraconazole	Janssen Pharmaceutica (Titusville, NJ)	esophageal and oropharyngeal candidiasis
Taxol® paclitaxel	Bristol-Myers Squibb (Princeton, NJ)	AIDS-related Kaposi's sarcoma
Valtrex™ valacyclovir	Glaxo Wellcome (Rsch. Triangle Park, NC)	episodic treatment of recurrent genital herpes and herpes zoster in immunocompetent adults, suppression of genital herpes simplex virus (HSV)

Approved Medicines for AIDS and Related Conditions

DRUG	COMPANY	INDICATION
VIDEX® didanosine (ddI)	Bristol-Myers Squibb (Princeton, NJ)	treatment of adult patients with advanced HIV infection who have received prolonged prior Retrovir® therapy, treatment of adult and pediatric patients (over 6 months of age) with advanced HIV infection who have demonstrated intolerance or significant clinical or immunologic deterioration during Retrovir® therapy
Viracept™ nelfinavir mesylate	Agouron Pharmaceuticals (San Diego, CA)	HIV infection, AIDS (pediatric and adult)
Viramune® nevirapine	Boehringer Ingelheim Pharmaceuticals (Ridgefield, CT)	management of HIV infection in combination with VIDEX® and Retrovir® in previously treated patients for whom current therapy is deemed inadequate
Vistide® cidofovir injection	Gilead Sciences (Foster City, CA)	CMV retinitis in AIDS patients
WinRho SD™ Rh_0(D) immune globulin intravenous (human)	Univax Biologics (Rockville, MD)	immune thrombocytopenic purpura (ITP) secondary to HIV infection
Zerit™ stavudine (d4T)	Bristol-Myers Squibb (Princeton, NJ)	HIV infection, pediatric HIV infection
Zithromax® azithromycin	Pfizer (New York, NY)	mycobacterium avium intracellulare (MAI) infections (prophylaxis)
Zovirax® acyclovir	Glaxo Wellcome (Rsch. Triangle Park, NC)	herpes zoster/simplex

The content of this survey has been obtained through government and industry sources based on the latest information. Survey current as of **November 7, 1997.** The information may not be comprehensive. For more specific information about a particular product, contact the individual company directly. For general information, contact P*h*RMA at (202) 835-3450. *If you are not receiving PhRMA's AIDS survey regularly but would like to, please send your request in writing to Editor, "New Medicines in Development for AIDS," PhRMA, 1100 15th St., NW, Washington, DC 20005.*

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Glossary

acyclovir—A drug used to treat viral infections, such as **herpes simplex** and **herpes zoster (shingles)**.

AIDS—Acquired immune deficiency syndrome.

aphthous stomatitis (ulcers)—Clinical term for "canker sores," which are small, painful ulcers on the inside of the cheek, lip or underneath the tongue.

ARC—AIDS-related complex.

aspergillosis—Infection caused by aspergillus, a fungus found in old buildings or decaying plant matter.

asymptomatic—A medical term that means "without symptoms" or feelings of illness noticed by the patient.

bacteremia—The usually transient presence of bacteria in the blood.

blastomycosis—A rare, non-contagious infection caused by breathing in a particular fungus found in wood and soil. The infection originates in the respiratory tract and usually disseminates to the lungs, skin and bone.

cachexia—Profound and marked state of general ill health and malnutrition.

candidiasis—A fungal *(Candida)* infection, usually of the moist cutaneous areas of the body, including the skin, mouth, esophagus and respiratory tract.

CMV—Cytomegalovirus is sexually transmitted and can occur without symptoms or result in mild flu-like symptoms. As an opportunistic infection in AIDS patients, it can cause **CMV retinitis**, an inflammation of the retina that can lead to blindness if left untreated.

Glossary

cryptococcal meningitis—A fungal infection affecting the three membranes (meninges) surrounding the brain and spinal cord.

cryptosporidiosis—Caused by a parasite *(Cryptosporidium parvum)* and characterized by chronic, profuse, watery diarrhea accompanied by fever, marked weight loss and enlarged lymph nodes.

endocarditis—Inflammation of the lining of the heart and its valves.

genital herpes—See **herpes zoster/simplex.**

genital warts (condyloma acuminata)—Soft warts that grow in and around the entrance of the vagina and the anus and on the penis. They are transmitted by sexual contact and are caused by a **human papillomavirus.**

herpes zoster/simplex—Three strains of the herpes virus often occur in AIDS patients: **Herpes simplex virus I (HSV I)**, which causes cold sores or fever blisters on the mouth or around the eyes, can be transmitted to the genital region. The latent virus can reactivate by stress, trauma, other infections or suppression of the immune system to produce infection. **Herpes simplex II (HSV II)** causes painful sores of the anus or genitals. The virus may lie dormant in nerve tissue and can be reactivated to produce the sores. **Herpes varicella zoster virus (HVZ)**, also called **shingles,** consists of very painful blisters on the skin and follows nerve pathways. It may appear in adulthood as a result of having had chicken pox (caused by the varicella virus) as a child.

histoplasmosis—A disease caused by a fungal infection that can affect all the organs of the body.

HIV positive/infection/disease—Presence of antibodies to the human immunodeficiency virus (the virus that causes AIDS) in the blood. **HIV-l** refers to the most common strain of the virus found in U.S. AIDS patients.

IM—Intramuscular.

immune thrombocytopenic purpura—A condition in which there is destruction of blood platelets by the immune system. The reduced number of platelets may result in abnormal bleeding into the skin (purpura) and other parts of the body.

immunocompromised—A condition in which the immune system fails to defend the body against infection and tumors.

IV—Intravenous.

Kaposi's sarcoma—A rare malignant skin tumor that occurs in some AIDS patients. It can be accompanied by fever, enlarged lymph nodes and gastro-intestinal problems.

leukoencephalopathy, progressive multifocal (PML)—Thought to be caused by a slow-replicating, unidentified virus, PML is an extremely rare progressive neurologic disease that occurs particularly in persons immunosuppressed by drugs or disease.

lymphoma—Cancers in which the cells of lymphoid tissue, found mainly in the lymph nodes and spleen, multiply unchecked. Lymphomas fall into two categories. One is Hodgkin's disease, characterized by a particular kind of abnormal cell. All others are **non-Hodgkin's lymphomas**, which vary in their malignancy according to the nature and activity of the abnormal cells.

MAC/MAI—Mycobacterium avium intracellulare (MAI) is a bacterial infection that can affect most internal organs, resulting in widely disseminated disease in AIDS patients. **MAC** refers to mycobacterium avium complex.

microsporidiosis—A protozoal infection common in animals and in immunocompromised humans. It may be the cause of profuse diarrhea.

molluscum contagiosum—A viral infection characterized by shiny, pearly white papules (tiny lumps) on the skin surface and easily transmitted by direct skin contact or during intercourse. The papules appear in groups, or sometimes alone, on the genitals, the inside of the thighs, the face or elsewhere.

mucosal—Pertaining to a mucous membrane.

mycoses—Diseases caused by fungi.

neuropathic pain—Caused by disease, inflammation, or damage to the peripheral nerves, which connect the central nervous system (brain and spinal cord) to the sense organs, muscles, glands, and internal organs.

neutropenia—An abnormally low number of neutrophils (a type of white blood cell) in the circulating blood. An inadequate neutrophil count leaves a patient vulnerable to bacterial and fungal infections.

NIAID—National Institute of Allergy and Infectious Diseases.

nosocomial—Originating or taking place in a hospital.

osteomyelitis—An infectious inflammatory disease of bone often of bacterial origin.

PCP—*Pneumocystis carinii* pneumonia. A type of lung infection found rarely in the general population but present in nearly 80 percent of all AIDS patients at some time during the course of the disease.

prophylaxis—Treatment intended to preserve health and prevent the spread of disease.

prurigo nodularis—A chronic inflammatory skin disease marked by itchy papules (tiny lumps).

suppression—Treatment intended to keep infection under control and to prevent its progression.

symptomatic—Subjective changes in the body or its functions that may indicate disease or phase of disease, as reported by the patient.

tinea versicolor—A chronic non-inflammatory fungal infection of the skin.

TMP/SMX—Refers to **trimethoprim-sulfamethoxazole,** an approved drug therapy for preventing and treating PCP.

toxoplasmosis—A disease due to infection with the protozoa *Toxoplasma gondii*, frequently causing focal encephalitis (inflammation of the brain).

viral load—Refers to the amount of virus in the body; used to measure the extent of illness.

visceral leishmaniasis—A severe infectious disease marked by fever, progressive anemia, low levels of leukocytes (white blood cells) and enlargement of the spleen and liver.

wasting syndromes—Any number of conditions, such as **anorexia** and **cachexia,** resulting in a loss of body mass, notably protein.

Facts About AIDS[1]

	U.S. AIDS Deaths through June 1996	*U.S. AIDS Cases through June 1997*
Adults/Adolescents	374,656	604,176
Pediatric (under age 13)	4,602	7,902
TOTAL	**379,258**	**612,078**

- Of the 604,176 cases of AIDS reported in the U.S., 84 percent were males aged 13 and older, and 15 percent were females aged 13 and older.
- From 1985 to 1996, the proportion of reported U.S. AIDS cases in women increased from 7 percent to 20 percent.
- For the first time, reported U.S. AIDS cases in 1996 were higher among African Americans (41 percent) than whites (38 percent). Hispanics accounted for 19 percent of AIDS cases in 1996.
- As of December 1996, an estimated 235,470 people in the U.S. were living with AIDS.
- In the U.S., approximately 25 percent of pregnant HIV-infected women not receiving AZT therapy have passed on the virus to their babies.

AIDS as a Cause of Death in the U.S.:

- AIDS is the eighth leading cause of death for all ages.
- AIDS is the second leading cause of death among people ages 25 to 44.
- AIDS is the leading cause of death of African Americans ages 25 to 44.
- AIDS is currently the fourth leading cause of death among U.S. women ages 25 to 44.
- AIDS is the seventh leading cause of death among children ages 1 to 14.
- In some cities in the northeastern U.S., AIDS is the leading cause of death among children ages 2 to 5.

Facts about Opportunistic Infections (OIs)

- The estimated incidence of AIDS OIs in the United States in 1996 was 57,200.
- **Cryptococcal meningitis** affects about 10 percent of people with AIDS. About four out of five people survive the initial phase of the disease, but half of those with AIDS who are treated for cryptococcal meningitis will experience a relapse within one year unless they receive maintenance therapy to prevent it.[2]
- More than 90 percent of people with AIDS show signs of active **CMV** infection, and almost one-third will experience serious CMV-related disease.[3]
- Many people with AIDS have **diarrhea** that persists for more than a month or is so severe that they expel several gallons of fluid a day, which can be life-threatening.[2]
- About half of all people infected with HIV develop neurologic complications including **encephalitis, meningitis,** infections of the brain, brain or spinal cord tumors, nerve damage, difficulties in thinking and behavioral changes (AIDS dementia complex) and stroke.[2]
- Nationwide, about 5 percent of people with AIDS have **histoplasmosis,** but in geographic areas where the *Histoplasma capsulatum* fungus is common, people with AIDS are at high risk for disseminated histoplasmosis.[2]
- **Molluscum contagiosum** afflicts an estimated 5 to 18 percent of HIV-infected people; as many as 33 percent of HIV-infected people with severely weakened immune systems are affected.[2]
- ***Mycobacterium avium* complex (MAC)** is diagnosed in up to 40 percent of people with AIDS in the United States, making it the most common bacterial OI, usually affecting people in advanced stages of HIV disease when the immune system is severely suppressed.[2]
- ***Pneumocystis carinii* pneumonia (PCP),** the most common presenting manifestation of AIDS, is a major and recurring cause of morbidity and mortality for people infected with HIV, occurring in up to 80 percent of those who do not take preventive therapy.
- Without treatment, close to 100 percent of HIV-infected patients with PCP die; with treatment, less than 10 percent die.
- About 40 percent of AIDS patients eventually develop some kind of brain disorder. **Toxoplasmosis** forms lesions on the brain which can disrupt mental processes and sometimes lead to personality changes.[2]
- The World Health Organization (WHO) estimates that 4.4 million people worldwide are coinfected with **tuberculosis (TB)** and HIV and predicts that by the year 2000, TB will kill 1 million HIV-infected people annually.[2]
- Even with treatment, for individuals coinfected with HIV and multi-drug-resistant TB (MDR-TB), the death rate may be as high as 80 percent, as opposed to 40 to 60 percent for people with MDR-TB alone.[2]

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1. *Unless otherwise noted, all data were provided by the U.S. Centers for Disease Control and Prevention (CDC)*
2. *National Institute of Allergy and Infectious Diseases (NIAID)*
3. *American Foundation for AIDS Research (AmFAR)*

THE DRUG DEVELOPMENT AND APPROVAL PROCESS IN THE '90s

It takes 15 years on average for an experimental drug to travel from the lab to U.S. patients.
Only five in 5,000 compounds that enter preclinical testing make it to human testing.
One of these five tested in people is approved.

			Clinical Trials						
	Early Research/ Preclinical Testing		Phase I	Phase II	Phase III		FDA		Phase IV
Years	6.5	File IND at FDA	1.5	2	3.5	File NDA at FDA	1.5	15 Total	
Test Population	Laboratory and animal studies		20 to 80 healthy volunteers	100 to 300 patient volunteers	1,000 to 3,000 patient volunteers		Review process/ approval		Additional post-marketing testing required by FDA
Purpose	Assess safety and biological activity		Determine safety and dosage	Evaluate effectiveness, look for side effects	Confirm effectiveness, monitor adverse reactions from long-term use				
Success Rate	5,000 compounds evaluated		5 enter trials				1 approved		

The Drug Development and Approval Process

By John D. Siegfried, M.D.
Deputy Vice President, Regulatory and Scientific Affairs, PhRMA

The U.S. system of new drug approvals is perhaps the most rigorous in the world. On average, it costs a company $500 million to get one new medicine from the laboratory to U.S. patients, according to a January 1996 report by the Boston Consulting Group.

It takes 15 years on average for an experimental drug to travel from lab to U.S. patients, according to the Tufts Center for the Study of Drug Development, Tufts University, based on drugs approved from 1993 through 1995. Only five in 5,000 compounds that enter preclinical testing make it to human testing. And only one of those five is approved.

Once a new compound has been identified in the laboratory, medicines are developed as follows:

Preclinical testing. A pharmaceutical company conducts laboratory and animal studies to show biological activity of the compound against the targeted disease, and the compound is evaluated for safety.

Investigational New Drug Application (IND). After completing preclinical testing, a company files an IND with FDA to begin to test the drug in people. The IND becomes effective if FDA does not disapprove it within 30 days. The IND shows results of previous experiments; how, where and by whom the new studies will be conducted; the chemical structure of the compound; how it is thought to work in the body; any toxic effects found in the animal studies, and how the compound is manufactured. In addition, the IND must be reviewed and approved by an Institutional Review Board where the studies will be conducted, and progress reports on clinical trials must be submitted at least annually to FDA.

Clinical Trials, Phase I. These tests involve about 20 to 80 normal, healthy volunteers. The tests study a drug's safety profile, including the safe dosage range. The studies also determine how a drug is absorbed, distributed, metabolized, and excreted as well as the duration of its action.

Clinical Trials, Phase II. In this phase, controlled studies of approximately 100 to 300 volunteer patients (people with the disease) assess a drug's effectiveness.

Clinical Trials, Phase III. This phase usually involves 1,000 to 3,000 patients in clinics and hospitals. Physicians monitor patients closely to confirm efficacy and identify adverse reactions.

New Drug Application (NDA). Following the completion of all three phases of clinical trials, a company analyzes all of the data and files an NDA with FDA if the data successfully demonstrate safety and effectiveness. The NDA must contain all of the scientific information that the company has gathered. NDAs typically run 100,000 pages or more. By law, FDA is allowed six months to review an NDA. The average NDA review time for new molecular entities approved in 1996 was 17.8 months.

Approval. Once FDA approves an NDA, the new medicine becomes available for physicians to prescribe. A company must continue to submit periodic reports to FDA, including any cases of adverse reactions and appropriate quality-control records. For some medicines, FDA requires additional studies (Phase IV) to evaluate long-term effects.

Discovering and developing safe and effective new medicines is a long, difficult, and expensive process. The research-based pharmaceutical industry will invest $18.9 billion in research and development in 1997.

New Medicines in Development for AIDS is presented by P*h*RMA in cooperation with the following organizations:

AIDS Action Council
AIDS Project Los Angeles
American Academy of Allergy, Asthma & Immunology
American Academy of Physician Assistants
American Association of Immunologists
American College of Allergy, Asthma and Immunology
American Foundation for AIDS Research (AmFAR)
American Nurses Association
American Social Health Association
Americans for a Sound AIDS/HIV Policy
Association of Nurses in AIDS Care
Athletes and Entertainers for Kids
CAVDA-Citizens AIDS Project
Center for Women Policy Studies
Clinical Immunology Center
Food and Drug Administration
Foundation for Retrovirology and Human Health
Gay and Lesbian Medical Association
Haitian Centers Council, Inc./Haitian Coalition on AIDS
Health Education Resource Organization (HERO)
Health Information Network/Seattle
Infectious Diseases Society of America
International Association of Physicians in AIDS Care
National AIDS Fund
National Association of People with AIDS
National Black Nurses' Association
National Coalition of Hispanic Health and Human Services Organizations (COSSMHO)
National Foundation for Infectious Diseases
National Institute of Allergy and Infectious Diseases (NIAID)
National Lesbian and Gay Health Association
National Medical Association
National Minority AIDS Council
National Native American AIDS Prevention Center
People with AIDS Coalition of New York
Planned Parenthood Federation of America
Project Inform
San Francisco AIDS Foundation
Women Alive

Being listed in this report in no way implies that the above-mentioned organizations endorse or recommend the use of any of the products in development contained in this publication. For further information, patients should consult their physicians or health care providers.

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CENTERS FOR DISEASE CONTROL AND PREVENTION

U.S. Department of Health & Human Services
Public Health Service
HRSA
Health Resources & Services Administration

NIDA
NATIONAL INSTITUTE ON DRUG ABUSE

Substance Abuse and Mental Health Services Administration
SAMHSA

May 9, 1997

HIV PREVENTION BULLETIN: MEDICAL ADVICE FOR PERSONS WHO INJECT ILLICIT DRUGS

Dear Colleague:

Preventing drug use and providing substance abuse treatment for persons who inject illicit drugs are crucial to preventing many blood-borne infections, including human immunodeficiency virus (HIV). However, many drug users are not currently in substance abuse treatment programs because of multiple factors including the limited availability of these programs and the lack of readiness or willingness of some drug users to enter substance abuse treatment. Consequently, substantial numbers of drug users continue to inject drugs.

This bulletin summarizes new information on preventing transmission of HIV and other blood-borne infections among persons who inject drugs and updates prevention recommendations published in April 1993. [*][1] The findings of a 1995 workshop on the use of sterile syringes by persons who inject drugs and several recent publications [2,3,4,5,6] indicate that persons who inject drugs should use sterile syringes[**] to prevent the transmission of HIV and other blood-borne infectious diseases. These conclusions should be considered by clinicians providing health care to persons who use or inject drugs and by public health professionals planning and carrying out HIV prevention programs for injection drug users (IDUs). Health professionals should inform IDUs that using sterile syringes is safer than reusing syringes, including syringes that have been disinfected with bleach. The information in this bulletin has been prepared for health professionals involved in programs serving persons who inject drugs. Separate educational materials will be prepared to inform drug injectors of these findings.

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[*] Issued jointly by the Centers for Disease Control and Prevention, the National Institute on Drug Abuse of the National Institutes of Health, and the Center for Substance Abuse Treatment of the Substance Abuse and Mental Health Services Administration.

[**] The term "syringes" is used throughout this bulletin to refer to both syringes and needles.

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

INJECTION DRUG USE AND THE TRANSMISSION OF HIV AND OTHER BLOOD-BORNE INFECTIONS

The reuse and "sharing" of blood-contaminated injection equipment and blood-contaminated dissolved drugs play substantial roles in the transmission of HIV,[2] hepatitis B virus (HBV), hepatitis C virus (HCV),[7] and other blood-borne infections. These infections cause illness and death among drug users, their sex partners, and, through mother-to-infant transmission, their children. More than one third (35%) of all AIDS cases reported in the United States in 1995 were directly or indirectly associated with injection drug use.[8]

Blood is introduced into needles and syringes at the start of every intravenous injection. The reuse of a blood-contaminated syringe by another drug injector (sometimes called "direct syringe sharing") carries a substantial risk of transmission of blood-borne infections, including HIV, HBV, and HCV. In addition, blood and blood-borne infections can be introduced into drug solutions by the use of blood-contaminated syringes to prepare drugs; the reuse of water; the reuse of bottle caps, spoons, or other containers ("spoons" and "cookers") used to dissolve drugs in water and to heat drug solutions; and the reuse of small pieces of cotton or cigarette filters ("cottons") used to filter out particles that could block the needle.[9,10] Multiperson use of contaminated water, dissolved drugs, and drug preparation equipment is sometimes called "indirect sharing."[11]

Because some "street" sellers of syringes repackage used syringes and sell them as sterile syringes,[12] persons who continue to inject drugs should obtain syringes from reliable sources of sterile syringes, such as pharmacies.

In addition to HIV, HBV, HCV and other blood-borne infections, persons who inject drugs are at risk of other serious infections.[13] Use of alcohol swabs to clean the injection site prior to injection has been shown to reduce the occurrence of cellulitis, injection site abscesses, and, possibly, endocarditis among persons who inject drugs.[13, 14]

CRITICAL IMPORTANCE OF PREVENTION AND TREATMENT OF DRUG DEPENDENCE

The risks of transmission of blood-borne illnesses are compelling reasons for strengthening public health and community efforts to help persons avoid starting drug injection and to help IDUs stop using drugs. Addiction is a major factor in the use of drugs such as heroin, cocaine, and amphetamines. While the recommendations in this bulletin will help reduce the individual and public health risks associated with injection drug use, the ultimate goals are to prevent at-risk individuals from initiating injection drug use and to help drug injectors stop drug injection through substance abuse treatment and recovery from addiction. For most persons who are addicted to drugs, admission to drug and alcohol treatment programs is a key step in reducing and/or stopping their drug use.

A 1995 WORKSHOP AND RECENTLY PUBLISHED STUDIES AND RECOMMENDATIONS

On February 15-16, 1995, a workshop on the role of sterile syringes in the prevention of HIV transmission among drug users who continue to inject was held at Johns Hopkins University in Baltimore, Maryland. The workshop was sponsored by the Centers for Disease Control and Prevention (CDC), the Center for Substance Abuse Treatment (CSAT) of the Substance Abuse and Mental Health Services Administration (SAMHSA), the National Institute on Drug Abuse (NIDA) of the National Institutes of Health (NIH), and the Johns Hopkins University School of Hygiene and Public Health.

In September 1995, the findings and conclusions of a two-year National Academy of Sciences (NAS) study were published in a report entitled "Preventing HIV Transmission: The Role of Sterile Needles and Bleach."[2] Also in September 1995, the *Journal of Acquired Immune Deficiency Syndrome and Human Retrovirology* published reports of the evaluation of laws enacted in Connecticut in 1992 that allowed the purchase without a prescription and the legal possession of as many as 10 syringes.[3,4]

In 1996, the U.S. Preventive Services Task Force published guidelines recommending that drug users who continue to inject be advised to use sterile syringes and take other steps to prevent health problems associated with injecting drugs.[5] Also in 1996, the American Medical Association published a physician guide to HIV prevention that stated that primary care physicians can help their patients reduce HIV risk from injecting drugs by encouraging them to "Use a new needle and syringe each time drugs are injected."[6]

Based on discussions during the 1995 Johns Hopkins workshop and the findings from these studies, the new recommendations for drug users who continue to inject drugs include: (1) substance abuse treatment to reduce or eliminate drug injection; (2) the use of sterile syringes to reduce the spread of blood-borne infections; (3) the use of new, ideally, sterile water and equipment to prepare drugs; and (4) adequate disinfection of the injection site by drug users to prevent local infection and endocarditis.

IMPLICATIONS OF NEW INFORMATION ON HIV RISKS ASSOCIATED WITH DRUG INJECTION

To minimize the risk of disease transmission, persons who continue to inject drugs should be advised to always use sterile injection equipment; warned never to reuse needles, syringes, and other injection equipment; and told that using syringes that have been cleaned with bleach or other disinfectant is not as safe as using new, sterile syringes. The NAS report stated: **"For injection drug users who cannot or will not stop injecting drugs, the once-only use of sterile needles and syringes remains the safest, most effective approach for limiting HIV transmission."**[2] CDC recommends that all syringes used for parenteral injections be sterile.[15] Drug preparation equipment, such as "cottons," "cookers," water, and syringes should not be reused because they are usually contaminated with blood. Most syringes and needles used by drug injectors were not designed for reuse. Boiling needles and syringes for 15 minutes between uses can disinfect the equipment. However, boiling may alter the shape and functioning of the plastic syringes widely used by drug injectors in the United States. Disinfecting previously used needles and syringes with bleach (or other chemicals) can reduce the risk of HIV transmission, but using disinfected syringes is not as safe as using a new, sterile needle and syringe.[16] The NAS report found that bleach disinfection (using the procedures described in the April 1993 NIDA, CSAT, CDC bulletin on bleach) is likely to be effective but ". . . is clearly an intervention to be used when injection drug users have no safer alternatives."[2]

PROVISIONAL RECOMMENDATIONS TO DRUG USERS WHO CONTINUE TO INJECT

Health care workers involved in programs that serve drug users should communicate the following recommendations to drug users who continue to inject. Adhering to these drug preparation and injection procedures will reduce the public health and individual health risks associated with drug injection for both drug users and other persons in their communities.

Persons who inject drugs should be regularly counseled to:

I. Stop using and injecting drugs.

II. Enter and complete substance abuse treatment, including relapse prevention.

III. Take the following steps to reduce personal and public health risks, if they continue to inject drugs:

Never reuse or "share" syringes, water, or drug preparation equipment.

Use only syringes obtained from a reliable source (e.g., pharmacies).

Use a new, sterile syringe to prepare and inject drugs.

If possible, use sterile water to prepare drugs; otherwise use clean water from a reliable source (such as fresh tap water).

Use a new or disinfected container ("cooker") and a new filter ("cotton") to prepare drugs.

Clean the injection site prior to injection with a new alcohol swab.

Safely dispose of syringes after one use.

The availability of new, sterile syringes varies, depending on state and local regulations regarding the sale and possession of syringes and on other factors, such as the existence of syringe exchange programs sponsored by local HIV prevention organizations.[17] If new, sterile syringes and other drug preparation and injection equipment are not available, then previously used equipment should be boiled or disinfected with bleach using the methods recommended in the April 1993 bulletin.[1]

In addition, drug users should be provided information on how to prevent HIV transmission through sexual contact and, for women, information on reducing the risk of mother-to-infant HIV transmission.

FOR MORE INFORMATION

For more information or to comment on this bulletin, please contact the following staff members of the organizations releasing this bulletin: **CDC** - Dr. T. Stephen Jones at 404-639-5200 (fax 404-639-5260); **HRSA** - Dr. A. Russell Gerber at 301-443-4588 (fax 301-443-1551); **NIDA** - Dr. Steven W. Gust at 301-443-6480 (fax 301-443-9582); and **SAMHSA** - Mr. Adolfo Mata at 301-443-5305 (fax 301-443-3817).

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Revised May 30, 1997

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HIV/AIDS PREVENTION Bulletin

April 19, 1993

Dear Colleague:

This letter contains new information on the role of bleach in human immunodeficiency virus (HIV) prevention programs for injecting drug users (IDUs). Based on recent research, bleach disinfection should be considered as a method to reduce the risk of HIV infection from re-using or sharing needles and syringes (and other injection equipment) **when no other safer options are available**. Sterile, never-used needles and syringes are safer than bleach-disinfected, previously used needles and syringes. This letter provides some recommendations on how bleach disinfection should be done. The letter was developed in collaboration with the National Institutes on Drug Abuse (NIDA) of the National Institute of Health (NIH) and the Center for Substance Abuse Treatment (CSAT) of the Substance Abuse and Mental Health Services Administration.

BACKGROUND

On February 9-10, 1993, the Centers for Disease Control and Prevention (CDC), CSAT, and NIDA co-sponsored a workshop at Johns Hopkins University, Baltimore, Maryland. The workshop reviewed current practices and research on the use of bleach to disinfect drug injection equipment.

Several papers in the 1980s showed that bleach inactivated HIV in vitro (MMWR 1982;31:577-80, Lancet 1984;2:899-900, J Infect Dis 1985;152:400-3, and JAMA 1986;255:1887-91). Those studies reported the effectiveness of bleach in inactivating HIV as cell-free virus or virus in cell culture. Bleach soon became the standard for use in needle hygiene programs, and small bottles of bleach were distributed to IDUs by outreach workers throughout the country, providing an important contact with out-of-treatment drug users. Distribution of bleach is an important element of outreach to IDUs; that outreach provides IDUs with AIDS prevention education and recruitment into drug abuse treatment.

RECENT RESEARCH ON BLEACH

Recent data raising questions about the efficacy of bleach cleaning were discussed at the Baltimore workshop. Bleach was found to be more effective than most other readily available solutions, such as alcohol and hydrogen peroxide, but **bleach was not as effective against HIV in blood** as it was against cell-free HIV and HIV in cell culture (N. Flynn et al., Sixth International Conference on AIDS, 1990 Abstract, S.C.761;3:279). Studies of the HIV seroconversion rates among a cohort of IDUs in Baltimore compared those who reported using disinfectants all the time with those who reported never using disinfectants to clean needles and syringes. No significant difference of seroconversion was found between disinfectant users and non-users (D. Vlahov et al., Epidemiology 1991;2:444-6, and unpublished data). A NIDA study found that a 10 percent dilution of household bleach (0.5 percent sodium hypochlorite) was not effective in removing blood from

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syringes using a 6-second rinse with bleach, followed by two 6-second rinses with water. Clotted blood was more difficult to clean from syringes than fresh blood (C. Contoreggi et al., Eighth International Conference on AIDS, 1992, Abstract P.C. 4280;2:291). Bleach may initially enhance clot formation when mixed with blood, which may hinder HIV inactivation (C. Contoreggi, unpublished data). Full-strength household bleach (5.25 percent sodium hypochlorite) effectively inactivated pelleted HIV at exposures of 30 seconds or greater, whereas 10 percent bleach was effective only after exposures of 2 hours (P. Shapshak et al., J AIDS 1993;6:218-9 [letter]). A study of videotapes of drug users re-enacting the last time they injected drugs found that of those who used bleach, more than 80 percent of 161 subjects used bleach for less than 30 seconds when cleaning syringes, although they reported cleaning for longer periods of time (A. Gleghorn, unpublished data).

IMPLICATIONS OF THESE FINDINGS

These research findings indicate that we must strengthen our efforts to help IDUs stop using and injecting drugs. Treatment for drug use (e.g., methadone treatment for opiate use) is very important in helping drug users stop or decrease drug use and drug injection. Those who continue to inject drugs must be encouraged to always use sterile injection equipment and warned to never re-use or share needles, syringes, and other injection equipment. Disinfecting previously used needles and syringes with bleach (or other chemicals) can reduce the risk of HIV transmission but **is not as safe as always using a sterile needle and syringe**. Care should be taken also not to re-use or share cotton balls, cookers, rinse/wash water, and other drug preparation and injection equipment because they may be contaminated with blood.

Drug users who continue to re-use or share injection equipment should be aware that this practice carries a high risk for acquiring and transmitting HIV. Injection equipment is not made to be re-used. Boiling needles and syringes for 15 minutes is one way to sterilize equipment between uses. However, boiling may alter the shape and utility of the widely used plastic needles and syringes.

Cleaning injection equipment with disinfectants, such as bleach, does not guarantee that HIV is inactivated. Disinfectants do not sterilize injection equipment. However, consistent and thorough cleaning of injection equipment with disinfectants such as bleach should **reduce** transmission of HIV if equipment is shared.

PROVISIONAL RECOMMENDATIONS

There is currently insufficient laboratory and behavioral research to make definitive recommendations on the best procedures for bleach disinfection. However, we believe the following steps will enhance the effectiveness of bleach disinfection of needles and syringes:

- **Cleaning should be done twice--once immediately after use and again just before re-use of needles and syringes.**
- **Before using bleach, wash out the needle and syringe by filling them several times with clean water. (This will reduce the amount of blood and other debris in the syringe. Blood reduces the effectiveness of bleach).**

- **Then, use full-strength liquid household bleach (not diluted bleach).**

- **Completely fill the needle and syringe with bleach several times. (Some suggest filling the syringe at least 3 times.)**

- **The longer the syringe is completely full of bleach, the more likely HIV will be inactivated. (Some suggest the syringe should be full of bleach for at least 30 seconds.)**

- **After using bleach, rinse the syringe and needle by filling several times with clean water. Don't re-use water used for initial pre-bleach washing; it may be contaminated.**

- **For every filling of the needle and syringe with pre-bleach wash water, bleach, and rinse water, fill the syringe completely ("to the top").**

- **Shaking and tapping the syringe are recommended when the syringe is filled with pre-bleach wash water, bleach, and rinse water. Shaking the syringe should improve the effectiveness of all steps.**

- **Taking the syringe apart (removing the plunger) may improve the cleaning/disinfection of parts (e.g., behind the plunger) might not be reached by solutions in the syringe.**

Staff of HIV prevention programs should review how the use of bleach is currently taught and promoted and how IDUs are using bleach. The principles of bleach disinfection described in this letter should be incorporated into guidance provided to IDUs. HIV prevention program staff, outreach staff, and drug users should work together to develop easily understood messages to communicate these steps.

SUMMARY

Bleach disinfection of needles and syringes continues to have an important role in reducing the risk of HIV transmission for IDUs who have no other option but to re-use or share a needle and syringe. The use of full-strength bleach as described should improve the effectiveness of the bleach disinfection.

AVAILABILITY OF NEEDLES AND SYRINGES

Given the importance of IDU access to sterile needles and syringes, public health officials may wish to review local laws and regulations that affect needle/syringe availability and possession (MMWR 1993; 42: 145-8). IDUs' access to sterile needles and syringes can be limited by state and Federal laws, including (1) prescription laws that require a physician's prescription as a condition for pharmacy sale of needles and syringes (in 11 states and the District of Columbia), and (2) drug paraphernalia laws that place criminal penalties on the possession and distribution of needles and syringes (in approximately 44 states and the District of Columbia). At this time, certain Federal statutes such as, for example, the Substance Abuse Prevention and Treatment Block Grant, 42 U.S.C. § 300x-31, and the Ryan White Comprehensive AIDS Resources Emergency Act, 42 U.S.C. § 300ff-1, have prohibitions on using funds obtained under those programs to distribute needles or syringes for illegal drug use. Needle/syringe exchange (NSE) programs may provide additional means of increasing the availability of sterile needles and syringes to decrease the re-use of injection equipment by addicts; however, the risks and benefits of NSE programs are still under study.

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FOLLOW-UP

CDC, CSAT, and NIDA continue to collaborate in developing policy recommendations in this area, and in additional laboratory, epidemiologic, and behavioral studies.

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MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

589 Update: Barrier Protection Against HIV Infection and Other Sexually Transmitted Diseases
597 Nosocomial Enterococci Resistant to Vancomycin — United States, 1989–1993

Update: Barrier Protection Against HIV Infection and Other Sexually Transmitted Diseases

Although refraining from intercourse with infected partners remains the most effective strategy for preventing human immunodeficiency virus (HIV) infection and other sexually transmitted diseases (STDs), the Public Health Service also has recommended condom use as part of its strategy. Since CDC summarized the effectiveness of condom use in preventing HIV infection and other STDs in 1988 (*1*), additional information has become available, and the Food and Drug Administration has approved a polyurethane "female condom." This report updates laboratory and epidemiologic information regarding the effectiveness of condoms in preventing HIV infection and other STDs and the role of spermicides used adjunctively with condoms.*

Two reviews summarizing the use of latex condoms among serodiscordant heterosexual couples (i.e., in which one partner is HIV positive and the other HIV negative) indicated that using latex condoms substantially reduces the risk for HIV transmission (*2,3*). In addition, two subsequent studies of serodiscordant couples confirmed this finding and emphasized the importance of consistent (i.e., use of a condom with each act of intercourse) and correct condom use (*4,5*). In one study of serodiscordant couples, none of 123 partners who used condoms consistently seroconverted; in comparison, 12 (10%) of 122 seronegative partners who used condoms inconsistently became infected (*4*). In another study of serodiscordant couples (with seronegative female partners of HIV-infected men), three (2%) of 171 consistent condom users seroconverted, compared with eight (15%) of 55 inconsistent condom users. When person-years at risk were considered, the rate for HIV transmission among couples reporting consistent condom use was 1.1 per 100 person-years of observation, compared with 9.7 among inconsistent users (*5*).

Condom use reduces the risk for gonorrhea, herpes simplex virus (HSV) infection, genital ulcers, and pelvic inflammatory disease (*2*). In addition, intact latex condoms provide a continuous mechanical barrier to HIV, HSV, hepatitis B virus (HBV), *Chlamydia trachomatis*, and *Neisseria gonorrhoeae* (*2*). A recent laboratory study (*6*) indicated that latex condoms are an effective mechanical barrier to fluid containing HIV-sized particles.

Three prospective studies in developed countries indicated that condoms are unlikely to break or slip during proper use. Reported breakage rates in the studies were 2% or less for vaginal or anal intercourse (*2*). One study reported complete slippage

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Barrier Protection — Continued

off the penis during intercourse for one (0.4%) of 237 condoms and complete slippage off the penis during withdrawal for one (0.4%) of 237 condoms (*7*).

Laboratory studies indicate that the female condom (Reality™ †)—a lubricated polyurethane sheath with a ring on each end that is inserted into the vagina—is an effective mechanical barrier to viruses, including HIV. No clinical studies have been completed to define protection from HIV infection or other STDs. However, an evaluation of the female condom's effectiveness in pregnancy prevention was conducted during a 6-month period for 147 women in the United States. The estimated 12-month failure rate for pregnancy prevention among the 147 women was 26%. Of the 86 women who used this condom consistently and correctly, the estimated 12-month failure rate was 11%.

Laboratory studies indicate that nonoxynol-9, a nonionic surfactant used as a spermicide, inactivates HIV and other sexually transmitted pathogens. In a cohort study among women, vaginal use of nonoxynol-9 without condoms reduced risk for gonorrhea by 89%; in another cohort study among women, vaginal use of nonoxynol-9 without condoms reduced risk for gonorrhea by 24% and chlamydial infection by 22% (*2*). No reports indicate that nonoxynol-9 used alone without condoms is effective for preventing sexual transmission of HIV. Furthermore, one randomized controlled trial among prostitutes in Kenya found no protection against HIV infection with use of a vaginal sponge containing a high dose of nonoxynol-9 (*2*). No studies have shown that nonoxynol-9 used with a condom increases the protection provided by condom use alone against HIV infection.

Reported by: Food and Drug Administration. Center for Population Research, National Institute of Child Health and Human Development, National Institutes of Health. Office of the Associate Director for HIV/AIDS; Div of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Svcs; Div of HIV/AIDS, National Center for Infectious Diseases, CDC.

Editorial Note: This report indicates that latex condoms are highly effective for preventing HIV infection and other STDs when used consistently and correctly. Condom availability is essential in assuring consistent use. Men and women relying on condoms for prevention of HIV infection or other STDs should carry condoms or have them readily available.

Correct use of a latex condom requires 1) using a new condom with each act of intercourse; 2) carefully handling the condom to avoid damaging it with fingernails, teeth, or other sharp objects; 3) putting on the condom after the penis is erect and before any genital contact with the partner; 4) ensuring no air is trapped in the tip of the condom; 5) ensuring adequate lubrication during intercourse, possibly requiring use of exogenous lubricants; 6) using only water-based lubricants (e.g., K-Y jelly™ or glycerine) with latex condoms (oil-based lubricants [e.g., petroleum jelly, shortening, mineral oil, massage oils, body lotions, or cooking oil] that can weaken latex should never be used); and 7) holding the condom firmly against the base of the penis during withdrawal and withdrawing while the penis is still erect to prevent slippage.

Condoms should be stored in a cool, dry place out of direct sunlight and should not be used after the expiration date. Condoms in damaged packages or condoms that show obvious signs of deterioration (e.g., brittleness, stickiness, or discoloration) should not be used regardless of their expiration date.

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† Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Barrier Protection — Continued

Natural-membrane condoms may not offer the same level of protection against sexually transmitted viruses as latex condoms. Unlike latex, natural-membrane condoms have naturally occurring pores that are small enough to prevent passage of sperm but large enough to allow passage of viruses in laboratory studies (*2*).

The effectiveness of spermicides in preventing HIV transmission is unknown. Spermicides used in the vagina may offer some protection against cervical gonorrhea and chlamydia. No data exist to indicate that condoms lubricated with spermicides are more effective than other lubricated condoms in protecting against the transmission of HIV infection and other STDs. Therefore, latex condoms with or without spermicides are recommended.

The most effective way to prevent sexual transmission of HIV infection and other STDs is to avoid sexual intercourse with an infected partner. If a person chooses to have sexual intercourse with a partner whose infection status is unknown or who is infected with HIV or other STDs, men should use a new latex condom with each act of intercourse. When a male condom cannot be used, couples should consider using a female condom.

Data from the 1988 National Survey of Family Growth underscore the importance of consistent and correct use of contraceptive methods in pregnancy prevention (*8*). For example, the typical failure rate during the first year of use was 8% for oral contraceptives, 15% for male condoms, and 26% for periodic abstinence. In comparison, persons who always abstain will have a zero failure rate, women who always use oral contraceptives will have a near-zero (0.1%) failure rate, and consistent male condom users will have a 2% failure rate (*9*). For prevention of HIV infection and STDs, as with pregnancy prevention, consistent and correct use is crucial.

The determinants of proper condom use are complex and incompletely understood. Better understanding of both individual and societal factors will contribute to prevention efforts that support persons in reducing their risks for infection. Prevention messages must highlight the importance of consistent and correct condom use (*10*).

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HEALTH AND SAFETY SERVICES
Participant Fact Sheet

COURSE:	**HIV/AIDS Starter Facts**
Course Number	3511
Purpose	To provide individuals with a knowledge base on HIV and AIDS and skills in separating facts from misinformation and opinions.
Prerequisites	17 years of age at the completion of the course.
Learning Objectives	Prepare individuals to – • Locate factual information in the *American Red Cross HIV/AIDS Facts Book.* • Distinguish among HIV, HIV infection, and AIDS. • Understand how HIV infection progresses. • Understand how HIV is and is not spread. • Understand how to prevent the spread of HIV. • Differentiate the facts about HIV and AIDS from misinformation and opinions.
Length	4 hours
Instructor	Taught by an authorized American Red Cross HIV/AIDS Instructor Trainer (r. 96) who has completed the IT orientation to the Basic HIV/AIDS Program: Fundamentals.
Certification Requirements	Pass a written test on HIV/AIDS facts with a minimum score of 80%. (**NOTE**: the test can be taken without taking the course.)
Certificate Validity	1 year
Participant Materials	*American Red Cross HIV/AIDS Facts Book* (329567) American Red Cross HIV/AIDS Starter Facts Certificate (Cert 3800)

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HEALTH AND SAFETY SERVICES
Participant Fact Sheet

COURSE:	**HIV/AIDS Facts Practice**
Course Number	3512
Purpose	Help participants develop a common base of knowledge and skills for sharing information about HIV and AIDS.
Prerequisites	17 years of age at the completion of the course. Possess HIV/AIDS Starter Facts Certificate (Cert 3800) issued in the last 12 months
Learning Objectives	The HIV/AIDS Facts Practice course prepares participants to -- • Share accurate and up-to-date information about HIV and AIDS with a group. • Recognize and acknowledge when they do not know an answer. • Refer community members to appropriate resources. • Share information about HIV and AIDS without using labels to describe people. • Share information about HIV/AIDS without including personal opinions.
Length	4 hours
Instructor	Taught by an authorized American Red Cross HIV/AIDS Instructor Trainer (r.96) who has completed the IT orientation to the Basic HIV/AIDS Program: Fundamentals.
Certification Requirements	Successfully complete the Participant Skills Assessment by: Demonstrating skill to communicate facts about HIV and AIDS accurately and clearly. Demonstrating elements of a nonjudgmental perspective by using language that describes behavior and sharing information without expressing personal opinions.

Certificate Validity	1 year
Participant Materials	*American Red Cross HIV/AIDS Facts Book* (329567) American Red Cross HIV/AIDS Facts Practice Certificate (Cert 3801)

American Red Cross HEALTH AND SAFETY SERVICES

Participant Fact Sheet

COURSE: African American HIV/AIDS: Fundamentals Community Sessions

Course Number: 3517

Purpose	Share sound, reality-based information with members of African American communities, particularly youth 12 and above, in culturally specific ways to enhance their decision-making skills and support an increase in self-protective behaviors.
Prerequisites	None
Learning Objectives	Through the use of culturally specific approaches and activities, participants will: Increase awareness of HIV transmission and prevention. Expand knowledge of HIV/AIDS facts. Personalize the facts so they become more meaningful. Apply those facts to their own behavior.
Length	Varies. Sessions of at least one hour are recommended; multiple sessions are encouraged for greater educational effectiveness.
Instructor	Facilitated by a currently authorized *American Red Cross African American HIV/AIDS Program: Fundamentals* Instructor.
Certification Requirements	None, although a "Has Attended" certificate (C3001) may be given to participants.
Certificate Validity	Not applicable.
Participant Materials	Appropriate brochures and handouts as determined by completing the Session Planning Checklist

American Red Cross **Participant Fact Sheet**

Course:	**African American HIV/AIDS Fundamentals Instructor Course**
Course Number:	**35171**
Purpose	To train individuals to facilitate factually accurate, nonjudgmental, and culturally appropriate HIV prevention education sessions with African American and multicultural groups.
Prerequisites	To be eligible to take the African American HIV/AIDS Fundamentals Instructor course, candidates must— ◆ Be at least 17 years of age. ◆ Have experience working with African American communities. ◆ Have basic teaching skills, including an understanding of how to meet group needs, as demonstrated by successful completion of American Red Cross Instructor Candidate Training (ICT), or its successor, or by current certification as an instructor in other Red Cross courses. ◆ Hold a current certificate in HIV/AIDS Starter Facts. (Candidates may either successfully complete this course or "test out" by passing the HIV/AIDS Facts Test.) ◆ Hold a current certificate in HIV/AIDS Facts Practice.
Learning Objectives	To prepare instructors who— ◆ Share facts about HIV and AIDS accurately, nonjudgmentally, and in culturally sensitive and culturally specific ways with African American and multicultural community groups. ◆ Discuss facts related to sensitive issues such as sex and sexuality, drugs, and drug use. ◆ Encourage participants to apply the facts about HIV and AIDS to their own behavior. ◆ Serve as resources in the community for information about HIV and AIDS. Instructors are expected to be knowledgeable about services that can contribute to a holistic approach to HIV prevention in African American communities; these may include employment services, drug treatment programs, youth programs, and parenting services.
Length	Minimum of 22 hours
Instructor	An authorized American Red Cross African American HIV/AIDS instructor trainer (IT) who has completed the IT orientation for the African American HIV/AIDS Program: Fundamentals.

General Resources

Certificate Requirements	To successfully complete the African American HIV/AIDS Fundamentals instructor course, an instructor candidate must— ◆ Be present for the entire course. ◆ Participate in training exercises. ◆ Receive a satisfactory rating on the Teachback. ◆ Pass two multiple-choice tests, with a minimum score of 80 percent on each test.
Initial Authorization	Initial authorization expires on December 31 if the instructor course was completed before October 1 of that year. If the instructor course was completed on or after October 1, initial authorization expires on December 31 of the following year.
Participant Materials	*African American HIV/AIDS Instructor's Manual: Fundamentals* (Stock No. 323116) *African American HIV/AIDS Instructor Candidate Workbook: Fundamentals* (Stock No. 323121) *Basic HIV/AIDS Instructor's Manual: Fundamentals* (Stock No. 329569) *HIV/AIDS Facts Book* (Stock No. 329567) *"Don't Forget Sherrie" Leader's Guide* (Stock No. 329580) *"Don't Forget Sherrie" Workbook* (Stock No. 329583) African Proverb Posters (Stock No. 329565) HIV/AIDS instructional posters (Stock No. 329554) American Red Cross HIV/AIDS brochures *Instructor Certificate* (F5736)